University of Alberta

Changing the Behavior of Residents in the Wildland/Urban Interface in Strathcona County, Alberta

By

Louise I. Stewart

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Science

in

Forest Biology and Management

Department of Renewable Resources

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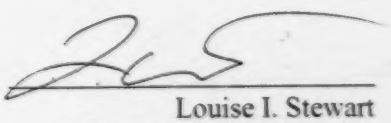

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For Susan and Jon

Abstract

Residents must know what constitutes a fire hazard to live safely in the wildland/urban interface. In the spring of 2000, 450 residents of Strathcona County, Alberta, Canada were randomly selected to test which of three educational methods would produce the greatest change in homeowner behavior. All 3 groups received a mail-out survey. Group 2 received printed fire safety information while Group 3 received an onsite assessment of their property and the printed fire safety information provided to Group 2. Results showed Group 3 had the greatest increase in their awareness of fire hazard. Group 3 was also more likely to make personal and inexpensive changes. Group 2 was likely to make changes that would be more effective over the long term. Additionally, the survey collected broad socioeconomic information that is comparable with similar studies. Information pertaining to access, signage, and visibility was also collected. This information will serve as baseline data for residents and fire hazards in the Dry Mixedwood vegetation type.

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Map Source: Strathcona County
Spatial Data Source: Altalis

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1.0 Introduction

A wildfire in the wildland/urban interface[1] (W/UI) can be devastating phenomena (Brown and Davis 1973, Pyne et al. 1996). These types of fires have the ability to kill people, pets, livestock and wildlife and if frequent in occurrence, these fires can adversely affect the composition and structure of surrounding native plant communities. Perhaps as importantly, these fires often destroy private property. Additionally, these fires are usually unplanned and their occurrence adds an additional burden to the already strained protection budgets of municipalities and provincial fire management agencies (Davis 1988, Rice and Davis 1991). For verification of these problems, one need only remember or read about the fires, which destroyed private property or took human life, in the vicinity of Oakland (Ewell 1995), San Francisco (Bruce 1995), and Los Angeles, California (Laughlin and Page 1987, Davis 1990, Weise and Martin 1995) or the fires that threatened the cities of Bend, Oregon, (Mills 1992), Penticton, British Columbia (Partners in Protection 1998), or Chisholm, Alberta, (Anonymous 2001). In all cases, homes or structures were destroyed, human and other life was injured or lost, and the economic viability of the responsible agencies was challenged.

The possibility that values-at-risk (human life, property, and wildland resources) may be damaged by fire increases as the outer edge of urban developments expand into the adjacent wildland ecosystem, and as more people build developments in wildland

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[1] In general, a "***wildland/urban interface***" situation exists whenever homes, cottages, cabins or outbuildings are located adjacent to continuous stands of wildland fuels. A "***wildland/urban intermix***" situation occurs when these human-made structures or development are nestled among or within the natural ecosystems (Pyne et al. 1996, Partners in Protection 1998). For the purpose of this thesis and for simplicity, both situations will be referred to as the "wildland/urban interface (W/UI).

environments (O'Neill 1988, DeFazio 1988, Bailey 1990). As people move out of the urban settings and into the surrounding wildlands, they become a part of the wildland/urban interface. This interface problem is common in many parts of Australia (Gates 1991), Canada (Partners in Protection 1998), Europe (Xanthopoulos 1998), and the USA (O'Neill 1988), and in many of these regions, people are the principal cause of wildland fires. This is particularly true in Alberta where humans were responsible for 36% of all wildland fires in the forested green zone between 1990 and 1999 (Rose 2000).

Much has been written about the wildland/urban interface fire situation (Hirsch et al. 1996). In general, the size of the wildland/urban interface is increasing annually in North America (Davis 1988, 1990b, Pyne et al 1996). There are many reasons for this increase. One reason seems to be the goal of people to get away from large crowds, pollution and crime rates (Davis 1988). For another, taxes may be less in undeveloped areas, and there are potentially fewer rules, regulations and services (Laughlin and Page 1987). Additionally, rural living is thought to offer cleaner air, water, and a quieter, more natural or relaxed lifestyle. Some believe, rural living allows an individual to become more self-sufficient (Bailey 1991). Still others think the cost of construction is less or housing is more affordable in these remote areas. For others, the remoteness allows for specific opportunities that cannot be found in most urban settings (e.g. raising livestock, operating all-terrain vehicles, growing specialty crops). However, many rural developments suffer from the constant threat of wildland fire.

It is well known that the threat from wildland fire increases as fuel loads increase adjacent to or near developments or when the plant communities are disturbed by such natural vectors as insects, disease, drought, human or animal use, or wind damage. This,

plus the increased number of fires that are started by humans that are using the developments, significantly aggravates the interface fire problem.

Residents and users of the wildland/urban interface can take steps to reduce or mitigate their risk of damage from fire. This is particularly true if they are knowledgeable of the potential hazards[2] and how to deal with them (Moore 1981, Partners in Protection 1998, Fried et al. 1999). Specifically, homeowners need to know about: (1) the importance of using fire safe products when building structures (Cohen 1991, LeVan 1998), (2) the need to maintain "defensible space" (Schmidt and Wakimoto 1988, Smith 1988, Summerfelt 1995, Partners in Protection 1998), (3) the need to maintain visible residential signage and passable roads or access routes to their buildings (Partners in Protection 1998) and (4) how to best involve their local governments in reducing the risk of fire damage to private and natural values (Rice and Davis 1991, Winter and Fried 2000). Further, homeowners must realize that it is their responsibility to take the prevention actions necessary before a fire starts (Wakimoto 1987). This is because there may be times when fire protection services may be unable to respond in sufficient time to save their property (Gardner and Cortner 1988, Bailey 1991) or if they do respond in a timely fashion, the burning conditions may be too severe for fire fighting forces to be effective (Lee et al. 1988). In general, the goal must be to develop 'FireSmart' communities (Partners in Protection 1998) and reduce the fire danger in the wildlands.

Davis (1990) surveyed fire managers in the United States and concluded that communicating with affected parties should be the highest priority for coping with the

wildland/urban interface problem. His survey suggested that educating those individuals responsible for regulating insurance rates and taxes and the public living in the W/UI would achieve "fire-safe" results. However, in practice and from experience, this has not been the case. He found that holding meetings where the W/UI homeowners were invited to attend resulted in "*firefighters talking to firefighters*". In general, he determined that W/UI homeowners failed to appreciate the need to participate in these discussions (Davis 1990). Interestingly other research, independent of the work of Davis (1990), reached the same conclusion.

Beebe and Omi (1993) determined from their surveys that many people have not personally experienced or even witnessed the power of a wildland fire and as a result were not concerned with these kinds of fires. This has made finding a solution to the occurrence of W/UI fire all that more difficult. They found many people coped with uncertainty by denying it. Additionally, Jackson in 1981 found that most people when faced with low frequency natural hazards (such as fire) preferred to wait for the event to occur and then respond, rather than execute prevention actions to minimize the occurrence. Slovic (1986, p.405) suggested people rebel against being given statements of probability rather than fact; they want to know exactly what will happen. This attitude allows people to live comfortably in dangerous situations as they either deny the danger of wildland fire or discount its impact (Beebe and Omi 1993). Thus they suggested people are unwilling to invest time or money in mitigating unsafe conditions, which was what Davis (1990) experienced.

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[2] Fire hazard is defined as the characteristics of the fuels present including amount, type and continuity. Fire risk is defined as the probability of ignition. Fire danger is the combination of fire risk and fire hazard (Pyne et al 1996).

The availability of homeowner's insurance also seems to give rural residents a false sense of security, which might also account for their complacency. By having insurance, homeowners seem to believe that they are protected. However, what most rural residents do not realize is that insurance cannot replace everything. Such things as family mementos, heirlooms and pets are commonly lost during fires. As well, scenic views, which perhaps were the reason for moving to this remote location, may be lost for decades. For those at risk, experiencing a wildland fire may be the only sure modifier of risky behavior as awareness is raised, which helps enlist public support (Beebe and Omi 1993).

1.1 The Situation:

The province of Alberta is divided into 2 zones, the green zone and the white zone. The green zone is also known as the forest protection area, which is the area for which Alberta Sustainable Resources, Forest Protection Division has the mandate to manage fire. Strathcona County is located within the white zone, which means the local authorities are responsible for responding to and managing any wildfire. Edmonton and the surrounding communities are also located in the white zone. In May 2002, a fire in the vicinity of Redwater, 80 km north of Edmonton, destroyed 4 homes and several other structures such as workshops and sheds. Another fire around Stony Plain (Duffield fire), west of Edmonton destroyed 2 homes, a garage and a carport. The 100 ha fire was started as a result of illegal backyard burning as a fire ban was in effect.

Fire is a real threat in the wildland/urban interface areas of Strathcona County, Alberta, Canada. Fire in the Dry Mixedwood vegetation of Alberta, which is the plant

community most common in the Strathcona County (Figures 1, 2 and 3), can result in intense burning conditions prior to green up and after leaf fall (Kunkel and Aslin 1988, Forestry Canada Fire Danger Group 1992). Fires were historically very common in this area before settlement due to lightning and aboriginal burning, which burned over very large areas of continuous fuels (Nelson and England 1971). However, many of these stands have not burned in over 100 years because changes in land use patterns, mostly agricultural expansion and community development, have resulted in significantly reducing wildland fire occurrence and spread. In the absence of fire, many of these natural stands are now old and decaying, leading to an increase in downed and dead material available for burning. Additionally, these fuels are continuous in the horizontal plane, which contributes to good fire spread (Pyne et al. 1996).

Figure 1. Dry Mixedwood vegetation in Strathcona County during spring showing the mixture of poplar, spruce, tall grasses and downed material (Photo: P.M. Woodard).

Figure 2. This mixedwood stand on private property contains mature spruce and is located in rural Strathcona County (Photo: L. Stewart).

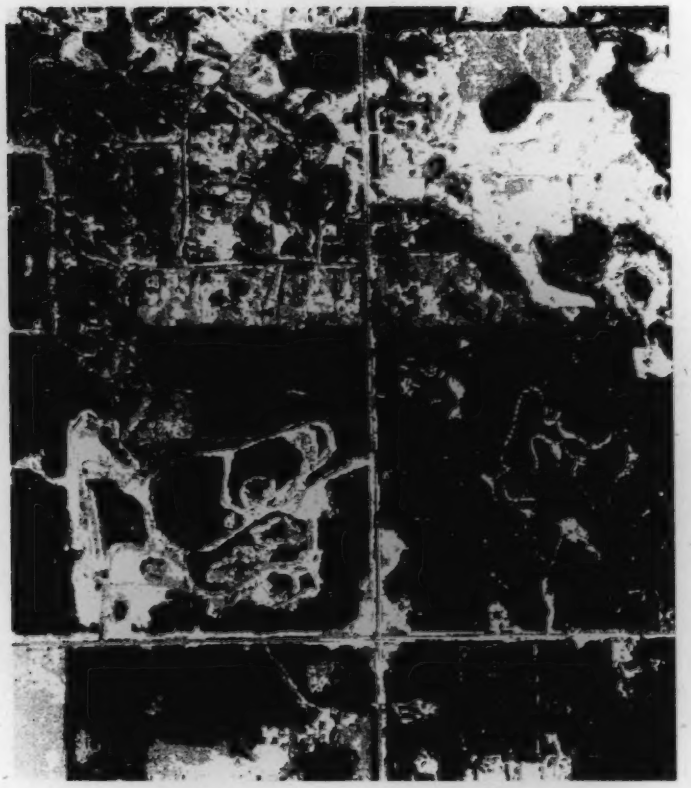

Figure 3. This air photo shows the spatial distribution of vegetation in the rural area of Strathcona County.

The weather in the Dry Mixedwood zone also contributes to the threat of fire. This is particularly true during the spring months (April and May) prior to green up when grasses are cured, soil moisture is low and the synoptic weather is normally dry (low relative humidity and low precipitation) (Johnson 1992). However, fires will also burn during the late summer and fall (August, September and October) when seasonal growth has died and cured, and the weather conditions have been dry for long periods of time. The Canadian Fire Weather Index System (FWI) is a system of rating fire danger (Van Wagner 1987) based on the amount of rainfall, relative humidity, wind speed and temperature measured daily. In Alberta, a FWI value of >=11 would mean the fire danger rating is high. A value of 19-29 is very high and values greater than 29 mean the fire danger rating is extreme. Measurements that are reflective of the situation in Strathcona County are recorded from Edmonton International Airport. The five year average from 1997-2001 for days where FWI values >=11 (high) is 67 days per year (Carr 2002). There was an average of 17 days where the rating was very high for the same five-year period and 13 days where the rating was extreme. Residents in the County have the greatest potential to suffer losses when the conditions that contribute to burning are the most dangerous (when FWI values are high, very high or extreme), and the probability of loss and the difficulty of protecting these residents increase as the number of interface situations increase.

From June 15, 2001 to June 15, 2002, there were 190 grass and brush fires in Strathcona County, 20 of them involved buildings being damaged or destroyed. These numbers include the urban area of Sherwood Park as some of the urban park areas were damaged by fire. For the majority of grass and brush fires in the urban areas, it was

determined that the cause was mischief related. For the majority of grass and brush fires in the rural area, the cause was related to residents burning (with a valid permit) where the fire got out of control. A fire ban was in effect for most of the 2002-burning season, eventually lifted on July 30. This increased length of time resulted in an increase in the number of violations committed by residents. Approximately 30 tickets were issued totaling close to $5000.00.

As in most W/UI areas, many Strathcona County residents have the mistaken belief that '*it can't happen here*' or if it does, it can be easily managed (Bailey 1991). Most residents know that the fire intensity (Byram 1959, Alexander 1982) common to the coniferous forests to northern Alberta are not likely to be experienced here (Johnson 1992). However what most residents don't know is that the fuel in these aspen/grass dominated stands is well aerated, continuous and when dry, it is available. And further, that under windy conditions, a fire will spread quickly through the grass and when structures are not built "FireSmart" damage can be immediate and long lasting. These fires can burn at high intensities but they don't occur very often.

Based on results of a study by Davis (1990) and a survey developed by Winter and Fried (2000), which examined the homeowner's understanding of the wildland/urban interface fire problem in Michigan, I developed a questionnaire to survey Strathcona County homeowners attitudes toward wildland fire and to assess their personal approaches to mitigate its affects. Road surveys, baseline questionnaires, and three different educational approaches (treatments), each more sophisticated than the other, were used to evaluate the state of danger in the wildland/urban interface in the County. These were then used to determine which treatment resulted in the greatest change in

homeowner behavior. The cost of delivering these three programs is substantially different but no attempt was made to evaluate the return on investment. Specifically, the objectives of this study were:

1. To determine the level of understanding by homeowners of W/UI issues.
2. To determine the level of hazard on private properties prior to treatment by examining homeowner behavior and property characteristics.
3. To test three different education approaches on private property owners to identify which is the most effective at changing the behavior of residents.

2.0 Study Area

Strathcona County is located in central Alberta (Figures 4, 5 and 6). It is immediately east of Edmonton Alberta, Canada, which is the capital of the province. The Municipal District of Sturgeon and the County of Lamont border the County on the north. Elk Island National Park, Cooking Lake-Blackfoot Recreation Area are located to the east. The southern boundary of the County is shared with the Counties of Leduc and Beaver. Strathcona County is Alberta's third largest municipality by population. It is classified as a Specialized Municipality in recognition of its combination of rural and urban areas under one municipal government (Strathcona County, July 2001).

Strathcona County covers an area of 1268 km^2. It has a population of approximately 69 000, and has an average population growth rate of 3% per year (Strathcona County, July 2001). The hamlet of Sherwood Park, which is the major urban center within the County, has a population of approximately 45 000, and covers 72 km^2. Natural wildland plant communities surround this hamlet and, in many places, these wild areas abut against developments within private property. About 24 000 people and their properties are located in the more rural subdivisions or as individual developments within the more remote areas of the County. The rural areas have experienced a population increase of 6% since 1998, and a 4.2% increase in the number of dwellings (Kreisel, 2001). Of the dwellings present in the rural area, 70.3% are country residences (mostly single family residences, which are not used for home-based businesses, or for farm purposes). These residences are not located in a town, a village, or the hamlet of Sherwood Park (Figure 7).

Figure 4. The above map of North America details the location of Strathcona County, Alberta within the Province of Alberta.

Figure 5. This regional map of Strathcona County, Alberta shows the surrounding municipalities.

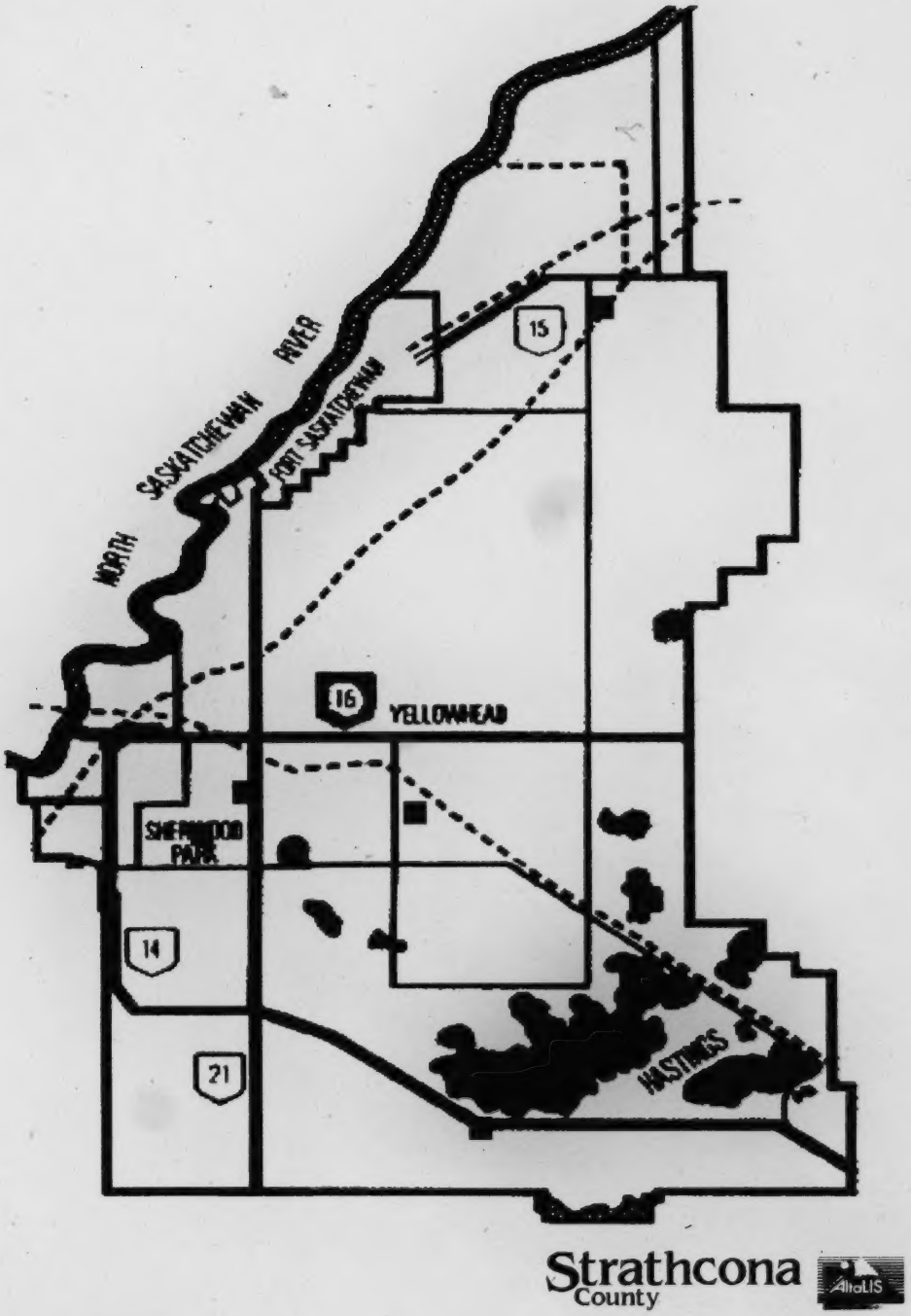

Figure 6. Map of Strathcona County showing major urban center of Sherwood Park in yellow. ■ Indicates locations of fire halls.

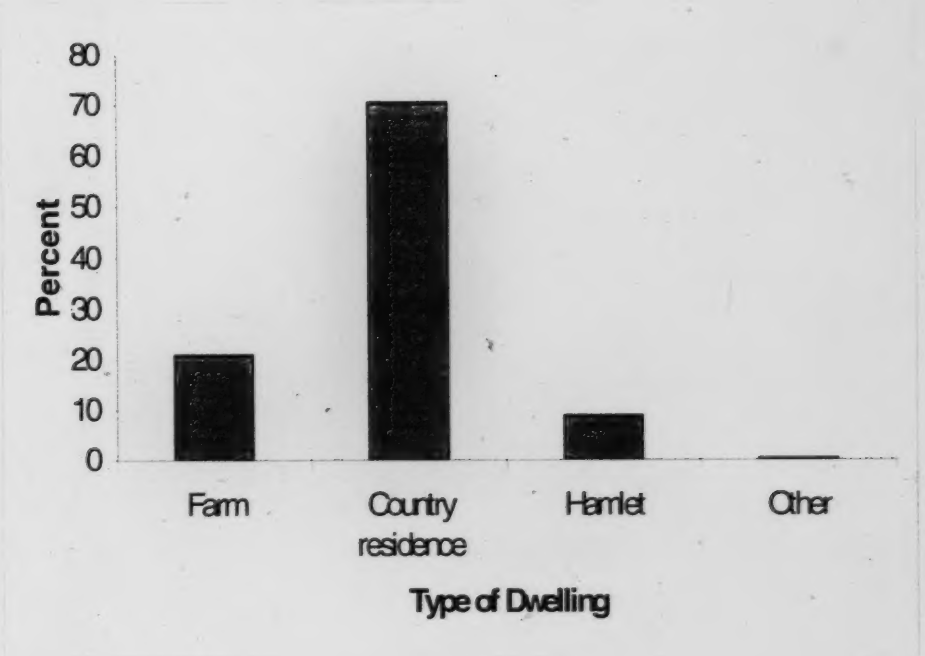

Figure 7. The dwelling types by farm, country residence, hamlet and other types within rural Strathcona County, Alberta, Canada.

Strathcona County has 5 fire stations located throughout the county (Figure 6). Of these, two are located within the hamlet of Sherwood Park. There are 77 full-time firefighters and 94 part-time (i.e., volunteer) firefighters (Strathcona County, July 2001).

The central Alberta region enjoys long hours of summer daylight where day lengths in excess of 16 hours are common. July is the warmest month in Strathcona County with an average high of 22°C (71°F). The coldest month is January with an average high of –7°C (19°F) (Strathcona County Economic Development and Tourism, 2001). Other statistics for Strathcona County are provided by Environment Canada (2001). These include:

a. Average Relative Humidity: 68%
b. Annual hours of sunshine: 4488 hours
c. Annual average snowfall: 136cm (53in)
d. Annual average rainfall: 35cm (14in)
e. Elevation: 700 meters (2300 ft)
f. Latitude: 53° 31'
g. Longitude: 113° 19'

The vegetation types (Figures 8 and 9) in the County are commonly classed as "Dry Mixedwood" by Beckingham and Archibald, (1996), while Rowe (1972) considers the vegetation in the area as an outlier of the boreal mixed-wood forest. Bailey and Anderson (1980) refer to the area as the "Aspen Parkland" because of the amount of open aspen/grassland found in this area of the Province. However, whatever classification is used, it is well known that grasses, shrub and forests dominate the plant communities found within this region. Aspen (*Populus tremuloides* Michx.[3]) and poplar (*P.*

[3] Plant nomenclature follows Moss (1983).

Figure 8. Photograph of vegetation on private land during 2002. Poplar and spruce are clearly visible (Photo: L. Stewart)

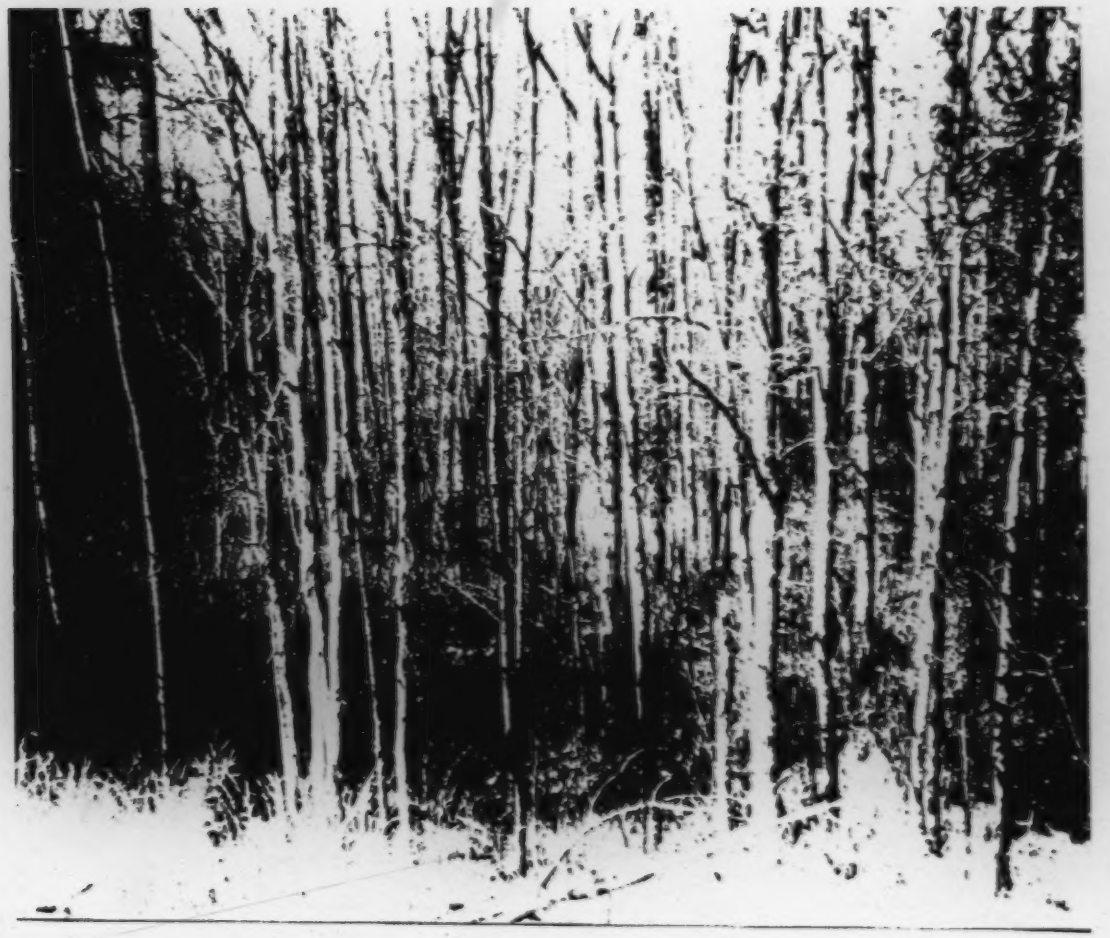

Figure 9. Poplar, spruce and dry grasses are visible in this picture of vegetation on public land during May 2001 (Photo: L. Stewart)

balsamifera L.) are the most common tree species found in the County. White spruce (*Picea glauca* (Moench) Voss), and jack pine (*Pinus banksiana* Lamb.) are also found in the County but on elevated, well-drained soils. White birch (*Betula papyrifera*), black spruce (*P. mariana*) and tamarack (*Larix laricina*) are found in low-lying wetter sites. Cool season grasses, such as *Festuca scabrella*, *Stipa spartea* var. *curtiseta*, are also common under open stands of trees and as pure grasslands. The dominant shrubs in the area are: snowberry (*Symphoricarpos occidentalis*), saskatoon (*Amelanchier alnifolia*), beaked hazel (*Corylus cornuta*), rose (*Rosa* spp.) and pincherry (*Prunus pensylvanica*). Willow (*Salix* spp.) and alder (*Alnus crispa*) are the dominant shrubs in wooded wetlands. In prairie wetlands, reed grasses (*Calamagrostis* spp.) and cattails (*Typha latifolia*) are the dominant plants.

The soils within the County are of the Brunisolic, Gleysolic, Luvisolic, Solonetzic and Organic Orders, which have been developed under the forest vegetation. Hummocks and hollows characterize the local topography with slopes in the range of 5 to 15 %. The elevation varies little and is around 750 meters above sea level.

3.0 Methods

In April of 2000, 450 private residences, acreages and farms-sites within or adjacent to the wildland areas of Strathcona County, as determined from aerial photographs, were randomly selected for study. The criteria for selection was that the properties be located within natural plant communities commonly found throughout the County. Owners of the widely scattered sample properties were then identified using Strathcona County land ownership maps.

The sample properties were then randomly divided into three groups, each receiving one of three selected treatments:

a. The property owners within **"Group 1 (G1)"** received an introduction letter (Appendix A) and the initial questionnaire (Appendix B), which was delivered by mail. This typed questionnaire attempted to ascertain the respondent's level of understanding of the potential fire hazards within the wildland/urban interface.
b. The property owners within **"Group 2 (G2)"** were sent the same initial questionnaire as was sent to **G1,** and additionally they were sent an information package consisting of "FireSmart" brochures (Partners in Protection 1998, Alberta Environment 2001). These brochures contained a checklist explaining potential fire-related hazards and methods to correct them (Appendix C).
c. The property owners within **"Group 3 (G3)"** also received the standard initial questionnaire, the information package sent to **G2** and an in-person home/building site evaluation/inspection. The Partners in Protection Hazard Assessment Form served as the basis for the on-site review (Appendix D).

A follow up questionnaire (second survey) (Appendix E) was mailed to all selected property owners in October 2000. The goal of the second questionnaire was to

identify the treatment that resulted in the greatest behavioral changes by the property owners. Specifically, this survey attempted to answer the question: "Did property owners make any modifications to their property in an attempt to reduce the potential losses that could result from an unwanted fire?"

Changes in such factors as roofing material or firewood storage were examined and served as a test of the residents' response to pre- and post treatment stimuli. The residents' willingness and capability to make changes were also examined. The three treatments were then compared to test the relative effectiveness of each. All variables were analyzed for changes in the dependent variables of awareness or behavior. Independent variables such as media exposure and past experience with fire were examined through questions within the surveys.

3.1 Timeline

April 2000:	Sample locations selected, divided into three groups, all mailed first survey.
June/July 2000:	Follow up of those properties that had not returned the first survey.
July–Sept. 2000:	Field assessments for Group 3.
August 2000:	Roadside observations completed.
October 2000:	Second survey (follow-up survey) sent to all respondents.
Nov.-Dec. 2000:	Follow up with those not responding from original sample.

3.2 Survey Design

For any mail survey to be effective, it must be completed and returned by the recipient. To increase the probability of this happening, all attempts were made to make the survey visually appealing, easy to answer, and non-invasive. The surveys and the enclosed self-addressed stamped envelopes were printed on University of Alberta stationary. Return envelopes were addressed to the Department of Renewable Resources

at the University of Alberta in Edmonton. An identification number was printed on each survey to allow for targeted follow-up mailing while the coding system allowed identification of the various respondents and to relate post survey results with pretests. No attempt was made to personally identify, qualify or judge respondents or responses. The correlations were used for scientific and statistical purposes only. Dillman (1978) has done extensive research on the administration of mail surveys and developed the 'Total Design Method' (TDM), which was implemented in this study.

The Human Ethics Review Committee within the Faculty of Agriculture, Forestry and Home Economics approved the protocols used in the study. All survey instruments were evaluated by this Committee to ensure sampling procedures conformed to the guidelines established by the Canadian Tri-Council policy pertaining to ethical conduct for research involving humans.

Fried et al. (1999) surveyed residents in Michigan on their willingness to pay for hazard (fuel) reduction. Some of the questions used in their survey were included in this survey of Strathcona County residents. Specifically:

a. Do you own or rent this property?
b. Is this your primary residence?
c. Each of the following events presents some risk to you. Please rank each of these based on your estimate of the likelihood that the event will occur.

    1. A tornado destroys your home.
    2. A car accident, which sends you to hospital.
    3. Being a victim of a burglary or robbery crime.
    4. A wildfire destroys your home.

d. Who do you feel is ultimately responsible for protection from wildfires – individual homeowners, local government or a combination of the two?
e. Did you consider the risk of wildfire when you moved into this home?

3.3 Follow-Up of Original Survey

In June and July of 2000, a follow-up letter was sent to all addressees who had not responded to my original request for information. This follow-up letter was similar to the original contact letter and included the survey and information to the appropriate groups.

3.4 Field Assessments

The field assessment portion for **G3** was accomplished between July and September 2000. Respondents were contacted by phone to arrange for a convenient time for the researcher and respondent to meet at the property. Assessments were done without regard for time of day or day of the week. This allowed me to schedule the assessment at the convenience of the respondent. Residents were shown the assessment form and the researcher explained how the hazard level for individual properties was calculated.

At the beginning of the assessment, the evaluator explained to the resident what items would be evaluated and why. Only one interviewer, the principal scientist, was used for this portion of the study, which was in an attempt to keep the assessments comparable. This approach enabled me to treat all landowners in a controlled, professional and reproducible manner. By developing this approach, results were believed to be comparable between landowners and not due to variations in interviewing or evaluating.

The assessment form addresses two specific characteristics of the property: (a) Structure and Site Hazard and (b) Area Hazard.

(a) The assessment of the structure and site examines factors such as the type of siding, roofing, slope etcetera. Each characteristic was given a specified point value and all points were totaled. The total value determined was used to assign the property to a hazard level category; low, moderate, high or extreme. Roofing and proximity to flammable vegetation are the most determining characteristics. Fire retardant roof coverings are rated Class A, B, or C which denotes the relative combustibility of the roofing surface. Class A rating denotes lower combustibility; Class C rating denotes higher combustibility (Partners in Protection 1998). If the home had wood shakes, which were un-rated, the factor was assigned a score of 30. This immediately put the structure and site into the high hazard level. Windows, decking, siding, eaves and roof cleanliness were the other factors examined that were part of the evaluation of the structure. The site hazard evaluation involved the area within the first 30 meters surrounding the home. Factors assessed as part of this phase of the evaluation were: slope, location of woodpiles, forest and surface vegetation and any ladder fuels present. The score for these factors is added to the "structure score" to obtain a total for the structure and site hazard level. Forest vegetation can be the determining factor in this section with continuous coniferous vegetation scoring the highest when within 10m of the home.

(b) The assessment of area evaluates the area 30 meters to 100 meters surrounding the home. Within this zone, the characteristics of vegetation type, ladder fuels and slope were assessed. Forest vegetation of continuous conifer trees assigned a grade of 20. Surface vegetation the continuity of ladder fuels and percentage and location on a slope

were also scored. The score for area hazard is calculated by adding the individual characteristic scores. This total would place the area into one of the 4 hazard levels.

The assessment form also includes a checklist for fire ignition and prevention as well as a checklist for fire suppression. The fire ignition and prevention checklist examined 2 factors: 1. The ignition potential for area and 2. The ignition potential for structure and site. Area ignition potential examined the frequency of lightning and human caused fires as well as the aspect of the property. The structure and site ignition potential examined characteristics of the chimney, burning barrel/fire pit and presence/absence of overhead power lines and propane tanks.

The fire suppression checklist also examined two factors: (1) fire service (response time, access to area and access to structure) and (2) water supply (particularly from where the water is obtained).

The evaluator completed these checklists with the homeowner during the assessment.

3.5 Roadside Observations

Throughout the summer of 2000, roadside observations were done on 322 properties located on 4 roads in Strathcona County. Two roads running north/south and two roads running east/west were randomly selected (Figure 9). No contact was made with the homeowner during this phase of the study. Every property along these 4 roads was examined. A check was not done to see how many, if any, of these properties were already included in the original survey as averages for examined characteristics were calculated and compared to the averages from the survey. Such physical characteristics

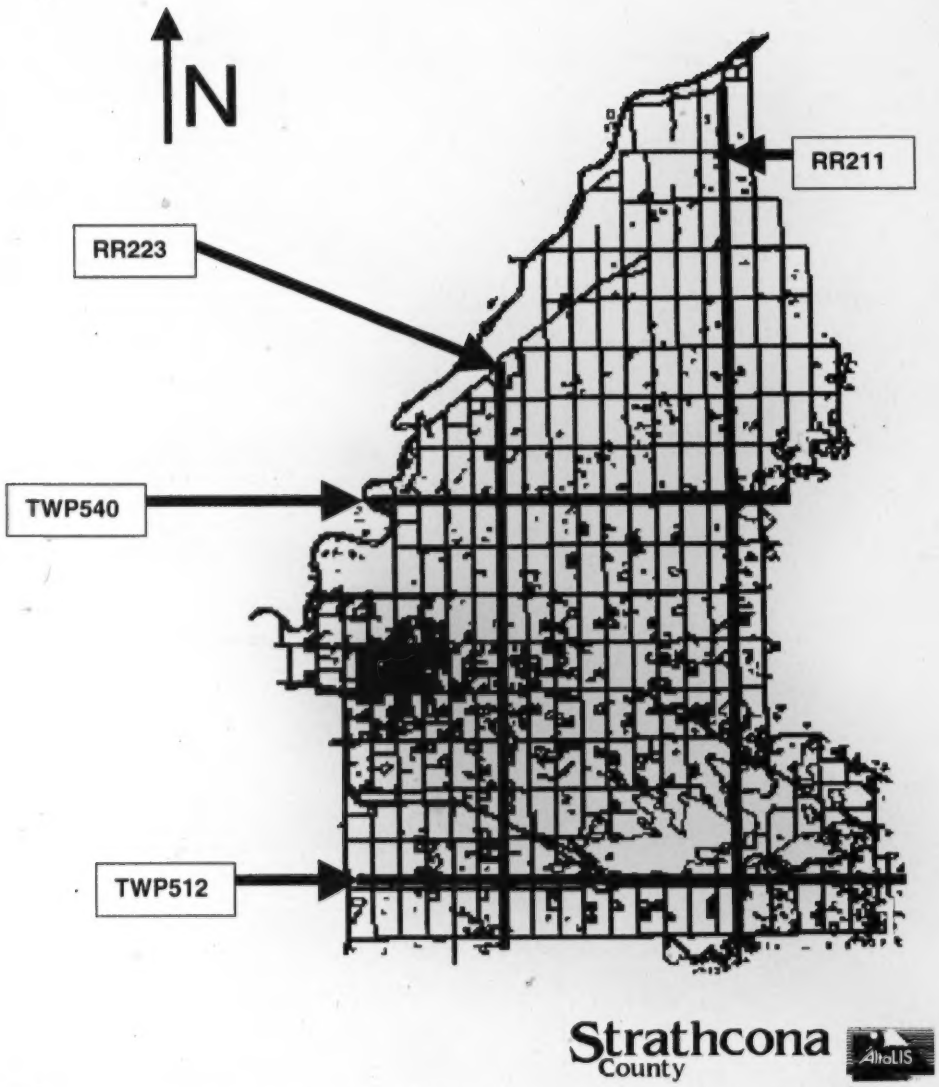

Figure 10. A map of Strathcona County, Alberta, showing the location of the four roads (two north/south and two east/west) selected for roadside observations.

as residence road width (driveway), visibility and address markings were recorded from the County roadway (Appendix F). Specifically, at each property, the presence/absence of and address sign was recorded (including address numbers on mailboxes) and the orientation of the sign relative to the road. If a sign was present, the address numbers were measured for size and determined to be greater or less than 5 cm in height. The visibility of home from roadway was also observed, and classed as full, partial or not visible. An adequate driveway width was defined as roads greater than or equal to 3.7 meters wide (Partners in Protection 1998). As access to property can be critical, the presence/absence of a gate (closed or open) across the driveway was also recorded. This information was compared to the responses given on the survey.

3.6 Second Survey

The second survey (Appendix E), which attempted to measure behavioral change in landowners/occupants, was sent to the respondents of all three groups in October 2000. This was well past the time when one might expect the homeowners to have dealt with fire-related concerns. Each group received its own specific letter directed to their group. The survey questions were identical; the difference was in the response rates indicated for each group. For example, the members of Group 2 received a letter indicating the response rate for Group 2 from the first survey. Members of Group 3 also received a copy of the field hazard assessment done on their property with a personal note of thanks for participating. Each sampled property owner was asked if they had made any changes or if they planned to make changes in the future. If the response indicated changes were to occur in the future, they were asked to explain why it had not yet occurred (i.e.

expense, time required). The survey was also mailed in a University of Alberta envelope and included a self addressed stamped envelope, which was again addressed to the Department of Renewable Resources at the University of Alberta. Identification numbers were not used to code respondents of this survey, therefore it was impossible to identify the individual respondent though their Group was determined by the different response rates indicated in the paragraph proceeding the returned survey.

3.7 Analysis

All data were entered into SPSS 8.0 for statistical analysis (Babbie and Halley, 1998). Responses to questions in the first survey were analyzed by frequency. Additionally, age, education and income for all three groups were compared to ensure the three treatment groups were similar, thus ensuring any differences in post-treatment responses were due to the treatment, and not to socio-economic biases peculiar to the groups.

Roadside observations were entered into a Microsoft Excel spreadsheet (Appendix F) and frequencies were calculated. These values were compared to the responses from the first survey to assess the accuracy of responses.

A 'perception/awareness of fire hazard' variable was created using Questions 9, 11, and 19 from the first survey (Appendix B) to determine how respondents perceived the fire hazard on their property (Singleton and Straits 1999). The three questions used were all given a similar scale in the same direction prior to indexing. A correlation matrix and the reliability coefficient (Cronbach's alpha) (Black 1999, Witwicki et al 2000) were determined to ensure these questions were highly correlated. Cronbach's

Alpha can range from 0 to 1.0. The larger the correlations among items used to construct the index, the larger the number of component items, the higher the Alpha (Carmines and Zeller 1979, Norusis 1994). It is generally agreed that an alpha (α) of at least 0.60 is reasonable while an α of 0.70 or higher is indicative of a high inter-term reliability (Witwicki et al 2000).

The second survey data set was also entered into a SPSS spreadsheet. Weights were assigned to each group to account for the unequal data sets (Rossi et al 1983). Chi square values were determined to test those questions that had significant results between groups.

Variables were also grouped into different categories to test for any pattern that may be present. These categories included:

1. Changes to the inside of home and personal actions taken.
2. Changes to vegetation and features on landscape.
3. Changes to structure.
4. Changes, which were relatively easy and/or inexpensive.
5. Changes, which were radical and/or reactionary to fear.
6. Changes, which were planned and effective in the long-term.

Reliability coefficients were determined for each grouping and the means were determined for each group within that category.

The second survey also asked residents if they felt they were more aware of potential fire hazards as a result of participating in this study. This result was compared

to the perception of fire hazard variable to test if the treatment created increased awareness or perception.

4.0 Results

4.1 First survey

Of the 450 surveys mailed, 386 were received by the current residents at the destination address. A total of 64 surveys were immediately returned by the local post office as undeliverable. Of those received (not returned), a total of 176 completed surveys were returned to the Department of Renewable Resources at the University of Alberta. This represents a return rate of 46%. The number returned varied by individual group, Group 1: 61/176 = 35%, Group 2: 67/176 = 38%, Group 3: 48/176 = 27% but in general the distribution among Groups was fairly well balanced.

4.2 General Sample Characteristics

From the 176 surveys that were returned, almost 80% of respondents were between the ages of 31 and 60. The average age was 49-years-old (Figure 11). Males completed most of the surveys (n = 62%), although it was obvious that a number of surveys were filled out by all members of the household, which worked on the questionnaire as a family (respondents stated this in the comments section). Results suggest 59% of the property owners (respondents) had completed college, technical school, or university; and 79% had some level of post-secondary education. Over half (57%) were employed outside the home (non-farmers) and 19% were retired. The

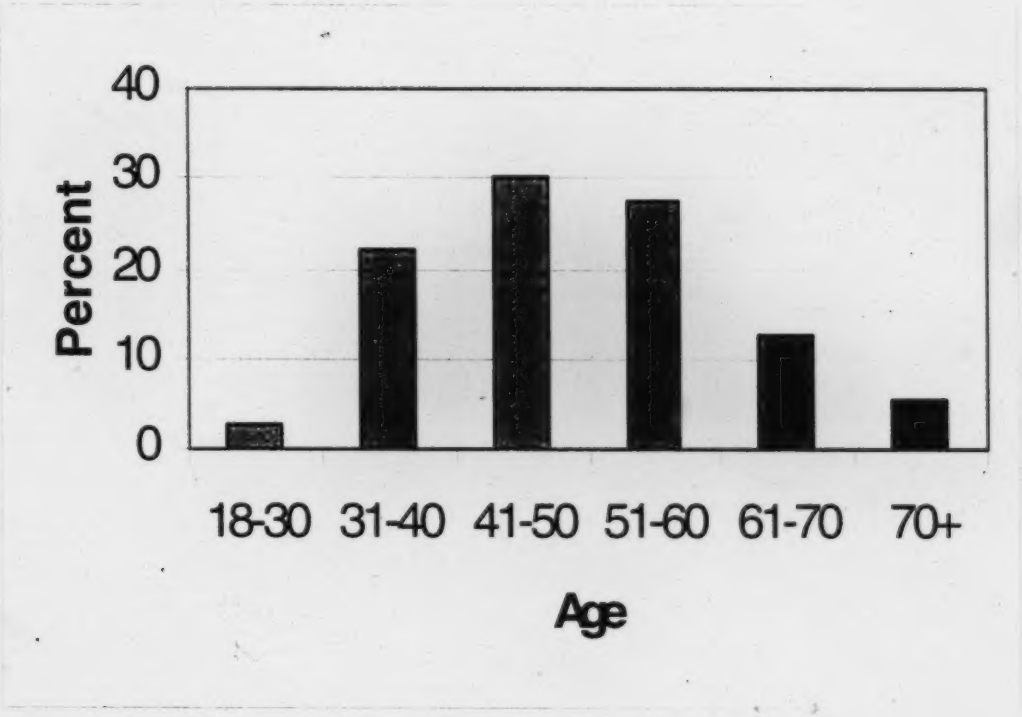

Figure 11. The age distribution of the 176 respondents of the first survey was reasonably well distributed. The average age of all respondents was 49.

average household income for the sample population was over $65 000 (Figure 12). Almost 55% have lived on the property for more than 10 years. All respondents indicated that their current property was their primary residence and all owned their property. The mean size of the properties was 5.3 hectares (12 acres). A complete listing of the results from the first survey is presented in Appendix G.

4.3 Similarities of Groups (averages)

Analysis of the first survey was done using the entire sample of 176 respondents who all received the same initial survey. To show that there was no bias between groups, characteristics such as age, income and education were compared between the 3 groups using analysis of variance. No significant difference was found.

Age	G1: 44.5 years (n = 54 respondents)
	G2: 45.7 years (n = 60 respondents)
	G3: 43.8 years (n = 46 respondents)
	Sig. 0.488
Education	G1: most have completed technical school/college (n = 54 respondents)
	G2: completed tech. school/college, some university (n = 58 respondents)
	G3: most have completed technical school/college (n = 46 respondents)
	Sig. 0.806
Income	G1: $63 750.75 CDN (n = 40 respondents)
	G2: $62 550.83 CDN (n = 46 respondents)
	G3: $52 500.50 CDN (n = 38 respondents)
	Sig. 0.244

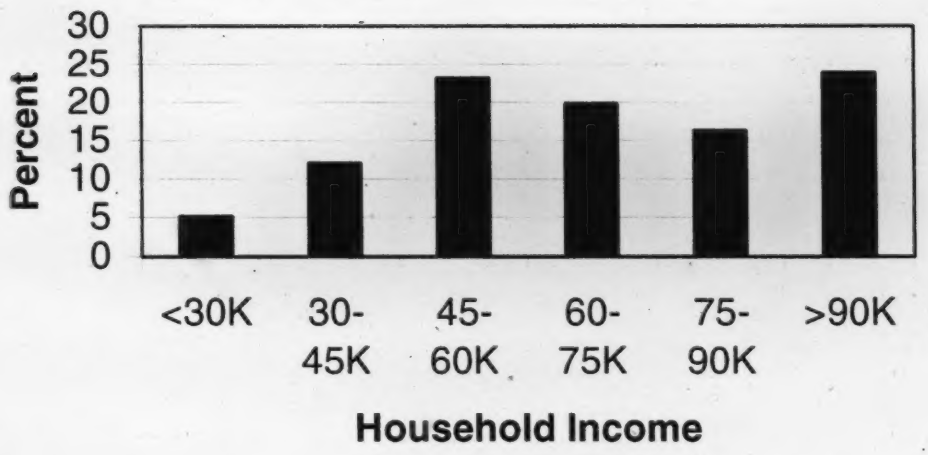

Figure 12. The income distribution was spread throughout all categories with an average household income of $66 000CDN.

4.4 First Survey Results

The following results were learned from the first survey.

1. Some property owners admitted to making some structural additions to buildings on their property, although only half of them considered the flammability of materials used in making these additions.

2. Almost 75% of the respondents reported they did not consider the risk of wildfire when they moved into these interface residences.

3. Over 50% of the homes have partial or no visibility from the road due to vegetation.

4. Almost 75% of the respondents rated the fire danger surrounding their property as intermediate to no danger at all. Another 20% felt the danger from fire was in the high range and only 5% felt it was extreme. These results suggest the majority of residents think that fire is not an immediate threat to their home, although 75% also reported that if a fire were to occur, their buildings and structures would likely burn (including 25% who didn't know what the fire danger was near their property). Later in the survey, respondents were asked a second time if they felt wildfire was a threat to their home. Answers to this question were similar to those of question 9, which asked respondents to rate the fire danger on their property on a scale of 1-7.

5. About half of the respondents said they had personally witnessed a forest fire within North America, some of which were out of control. Almost 66% of the respondents reported they had personally witnessed fires within Strathcona County. Some of these fires were known to have destroyed buildings. However, none of the respondents indicated that any lives had been lost as a result of the fire they witnessed.

6. Almost all respondents said they mow the grass around their homes and most mow the grass and other vegetation on and around the other buildings on their property.

7. Over half said they have made modifications to the vegetation on their property with fire hazard reduction being the motivation. Specifically, over 80% of respondents said they remove at least once a year the organic debris that accumulates in gutters and on the roof surfaces of their buildings.

8. Almost half of the respondents said their fire pits are within 10 meters of the vegetation but greater than 10 meters from the home. The results of this survey suggest the distance from the home to the fire pit is reasonably good with 44% responding their fire pit as being greater than 15 meters from the home.

9. The distance from burning barrels to vegetation and the home is similar to that of the fire pit. Over 75% of these barrels commonly use a screen or mesh to reduce the risk of long-range spotting due to firebrands.

10. Most residents store firewood on their property. Although half keep it stored outside and away from all buildings, almost 23% stack it beside a building, which is not safe.

11. Many residences (58%) have vinyl or wood siding and 15% use un-rated wood shakes on their roofs while over 67% use asphalt shingles.

12. Many residents are not aware of programs or resources offered by the Emergency Services Department.

13. Almost 70% of the respondents did not know the amount of dollars spent by Strathcona County on fire prevention and preparedness. Another 26% felt it was just about the right amount. Only 1% felt too much was spent and 4% felt the amount was too little.

14. Most respondents did not know how much their neighbors have done in terms of fire prevention. Although, about 25% felt they had done about the same as their neighbors, which could range from manipulating the vegetation to doing nothing.

15. Less than 20% felt that the government of Strathcona County should have more responsibility for fire protection and prevention than the homeowner. Most felt it should be equally shared while more than 25% felt the homeowner should take the majority of the responsibility.

16. Any program that may be implemented by Strathcona County would most likely require funds from the tax base. Residents would have to be supportive of any program financially (and in principle) and so they were asked how they felt about the level of taxes. Although this was a 'loaded question', the results were encouraging. One quarter felt they were taxed 'about the right amount' while another 1/4 felt taxes were slightly high. Very few felt they paid too little while the majority (43%) felt they paid too much in taxes.

17. Most respondents watch some kind of nature programming and almost 85% have watched programs regarding forest fires.

18. Only a small number of respondents (less than 2%) have taken advantage of fire prevention web sites available on the Internet.

19. Over half of respondents read a daily newspaper often and almost all read it periodically. Many read the local papers sometimes or often.

20. Almost 66% of the respondents replied someone was home during the day (working hours), although there was no indication how old these individuals were.

21. For events that pose the greatest risk to them or their property, respondents ranked the four choices in the following order:

    a. a car accident,
    b. being a robbery victim,
    c. wildfire destroying home followed lastly by
    d. a tornado destroying home

4.5 Responses to Open Questions

As part of the first questionnaire, (Question 67) respondents were asked if they had done anything in preparation for a potential fire, residential or wildland. Examples given included purchase of fire insurance or a security system that detects fire. A total of 286 different and independent responses were received. Responses included:

1. already purchased fire insurance (n=75),
2. installed additional smoke detectors and fire extinguishers (n=117),
3. manipulated the vegetation in some respect in an attempt to reduce the impact of unwanted wildland fire(n=28),
4. installed escape ladders on their homes or had purchased additional fire fighting hoses or tools (n=20),
5. contacted members of the County Fire Department to evaluate their property, and (n=2)
6. taken special precautions to store flammable materials away from their home (n=10).

Only nine respondents specifically indicated that they had done nothing to reduce the danger of unwanted fire, and one person felt their property was too wet to burn.

In Question 68, respondents were asked what they would do if they heard that a fire was burning in an area near their property. Examples given included calling 911, which is the emergency phone number to local authorities or the fire department. There were 202 responses to this question. Some respondents reported they would:

1. call the local fire department or emergency number (911) (n=132)
2. call the provincial forest fire hotline (780-427-FIRE or 780-427-3473) (n=5), though only one respondent responded with the correct phone number,
3. make themselves available to help (n=20),
4. notify the affected neighbors or their families directly (n=16),
5. monitor the fire in relation to their own home (n=7),
6. evacuate their homes (n=6),
7. soak down their home and the vegetation in the surrounding area (n=3), and
8. listen to radio and call local officials for updates (n=7).

One respondent replied they would do nothing while another reported they would phone their insurance agent. (*As part of understanding the knowledge level of respondents, it is important to know that the provincial fire agency has no responsibility for wildland fires in Strathcona County. At best the Provincial Dispatcher in Edmonton would likely only call the fire authorities for the County.*)

At the end of this initial survey, respondents were asked if they had any questions or comments. Responses to this section were again varied. Some indicated they didn't understand a particular question or clarified their previous responses. Others used this

opportunity to relay a personal experience with fire (i.e. a fire that started on their property or that of their neighbors). Some indicated that the survey had forced them to evaluate their home in terms of fire safety. Others used this section to express their feelings regarding the local government policies, tax levels and other issues not related to this survey.

In general, the comments at the end of the survey were very positive and encouraging. A few of the respondents specifically mentioned that the survey had made them evaluate their home and burning habits. Some of these respondents asked about programs available in the area for homeowners to discuss fire hazards, while others asked about the availability of school programs for the youth in the County. Follow-up correspondence was sent to all individuals who asked questions with the information they were seeking or contact information for someone who could help them.

4.6 Perception of Fire Hazard

A 'perception/awareness of fire hazard' variable was calculated using the results of Questions 9, 11 and 19. This variable was not group specific and the results of this analysis were based on entire set (176) of responses. Specifically, for Q9: On a scale of 1-7, with 1 being no danger and 7 being extreme danger, "*Do you feel the plants and trees surrounding your home present a fire danger?*" For Q11, respondents were asked, "*Do you feel that if these plants or plant communities were to catch fire, that this would cause your buildings to burn?*" For Q19, the respondents were asked, "*Do you feel wildfire is a threat to your home?*" These variables had a reliability coefficient of α=0.7205. Because of the high alpha value and the significant correlation, they were

indexed to form the perception variable for the first survey. Frequencies for each question are found in Appendix G. The correlation matrix of this variable is summarized in Table 1.

Table 1. Correlation matrix for Questions numbered 9,11 and 19 on the original survey instrument (Appendix A).

	Q9	**Q11**	**Q19**
Q9	1.000	0.395**	0.524**
Q11	0.395**	1.000	0.451**
Q19	0.524**	0.451**	1.000

** Correlation is significant at the α=0.01 level (2-tailed).

The overall 'fire awareness' average (Fig. 13) from the first survey was 0.5824 on a scale of 0-1 with 1 being more aware. Again this average is based on 176 responses from the first survey. The post study overall 'fire awareness' average for all respondents, regardless of group, was 0.6362. This suggests there is increased awareness in fire as a wildland disturbance in Strathcona County by respondents as a result of the study. However, results varied by group. Specifically, the post-treatment average for Group 1 was 0.5263, which is below their pre-treatment mean of 0.5432. The post-treatment mean for Group 2 was higher at 0.6842 than the pre-treatment mean of 0.6055 for this group, and for Group 3, post-treatment mean showed the greatest increase of awareness with a post treatment mean of 0.7857 as compared to the pre-treatment mean of 0.6186.

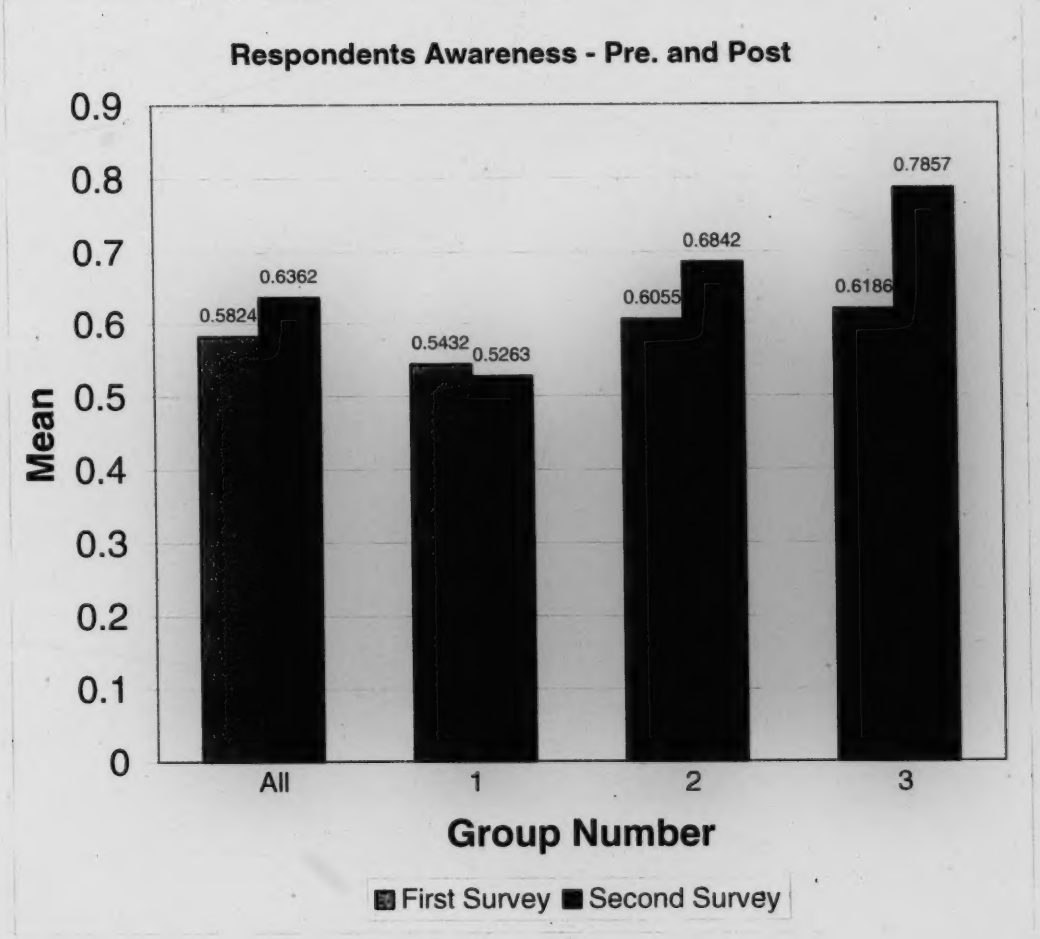

Figure 13. The fire hazard awareness increased for the entire sample and individually for Group 2 and Group 3 after treatment. Group 1 showed a slight decrease.

4.7 Roadside Observations

Roadside (drive-by) observations of the 322 rural homes (Figure 9) were done to test if the results reported by the respondents were reasonable. The first survey results show that almost 85% of respondents feel their home is clearly or partially visible from the road. However, drive-by observations found that 75% of the homes surveyed were clearly visible from the road (Figure 14). Results of the first survey suggested that 70% of the property signs had address numbers >5cm. The drive-by survey determined that in fact 76% of the address signs had characters >5cm. Other characteristics examined during the drive-by surveys include access road width and the presence/absence of a gate. Over 97% had an access road that was greater than 3.7m, which would allow a large emergency vehicle to access the home. Over 30% had a gate at the end of the access road. Presence of gate was recorded regardless of whether it was open or closed. Another characteristic examined was the address sign located along the road. Although the first survey asked respondents if they had a sign and the size of the numbers, the roadside observation allowed us to identify and record the orientation of the sign. Thirty-five percent of properties were found to have address signs that were parallel to the road surface. I interpreted this to be a problem for emergency personnel trying to locate the home as they may bypass the sign. Also, 17% of signs had numbers only on one side of the sign (Figure 14). Depending on the direction of travel, the sign may be missed as it can only be seen from one side.

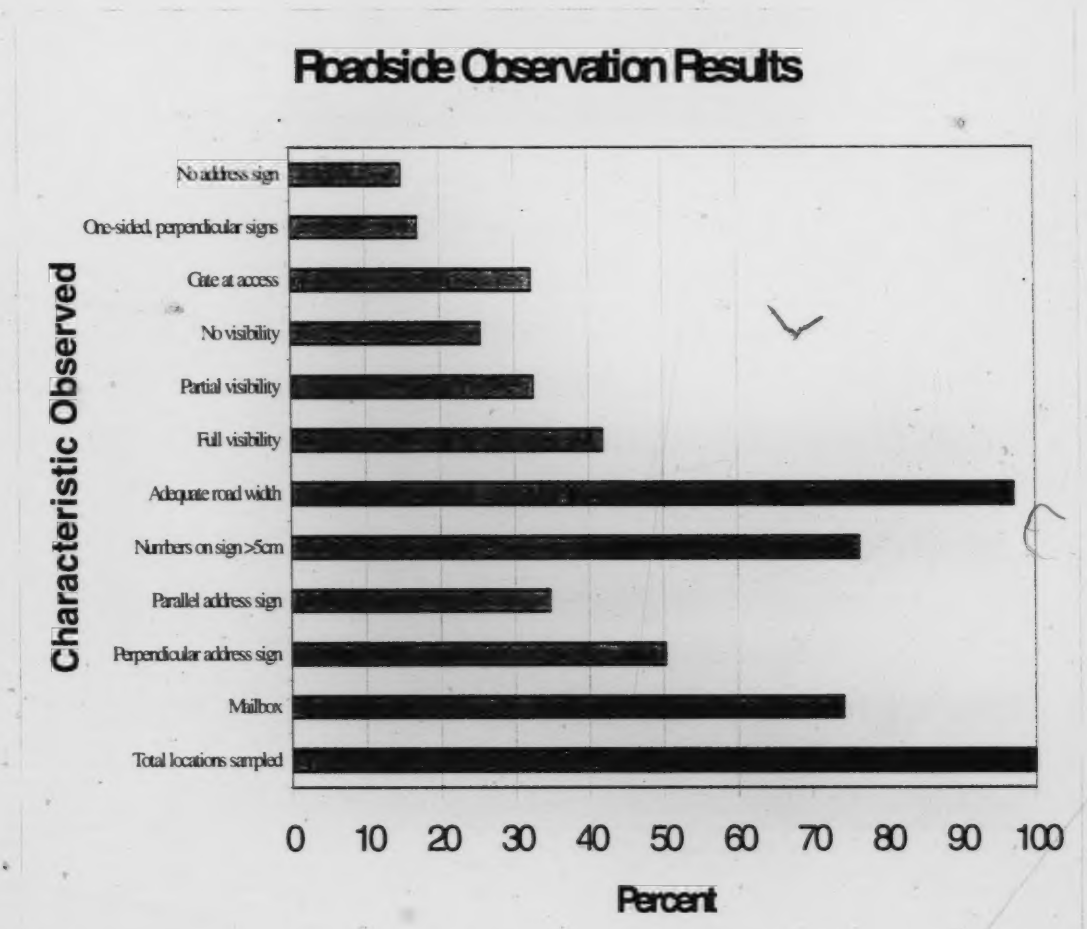

Figure 14. Roadside observation results indicating the characteristics recorded and the corresponding percentage of properties with that characteristic.

4.8 Field Assessments – Group 3

The Partners in Protection field assessment form (Appendix D) evaluates two aspects of the individual properties. These are: "Structure and site hazard", and "Area hazard". Using this methodology, it was determined the most common hazard level for the "structure and site hazard" was moderate, and the most common hazard level for "area hazard" was low for the properties visited. Table 2 shows the breakdown of the assessments. Those respondents whose properties were in the low/moderate category for both structure and site and for area are unlikely to have fire be a problem. Fire could be a problem for those respondents who had high or extreme hazard level for structure and site and low or moderate for area. The same would apply if the area rating was high or extreme but the rating for the structure and site was low or moderate. Fire would likely be a problem for any respondents falling into the high or extreme levels of both structure and site and area.

Table 2. Results from the field assessments for members of Group 3. The numbers in the table show the relation of hazard due to area factors in hazard related to structure and site factors.

		Area			
		Low	Moderate	High	Extreme
Structure and Site	Low	13	0	0	0
	Moderate	6	0	0	0
	High	2	0	0	0
	Extreme	4	0	0	0

The field assessments verified some of the responses from the first survey. Almost all properties were reasonably well maintained with the grass mowed beside the main home and vegetation and debris cleared from beside the home. Most properties had both deciduous and coniferous trees on their property and less than half were completely obscured by vegetation from the road.

Forest vegetation can be a determining factor in structure and site hazard section of the evaluation with continuous coniferous vegetation within 10 meters of the home having a large impact on the score (other than the roofing material). Most of the assessments in this study found that the vegetation present on the properties was deciduous and most of these plants were located more than 10 meters from the home, which is relatively safe. Hence, the typical hazard level for the field assessments was moderate which meant the properties had scored in the 21-29 point range. Most points were given points for un-safe siding on the home (vinyl or wood – 6 points.), or a combustible deck that was not sheathed, or for having wild grass and shrubs within 30 meters of the home.

The area hazard within the zone 30 meters to 100 meters surrounding the home was also evaluated. Within this zone, the characteristics of vegetation type, ladder fuels and slope were assessed. All properties evaluated fell into the low hazard level, which meant the properties scored below 21 points. In general, most properties had deciduous vegetation present within this area with native grasses and shrubs present on the surface of the soil. Ladder fuels were limited and scattered within this zone, which significantly reduced the fire hazard. There were many homes that had some scattered down and dead

woody material within the zones of protection surrounding their home-sites but the loading was not judged to be significant mostly because of a lack of continuity between fuels. Slope was very rarely a factor as most homes were located on fairly level terrain or where slope was not greater than 10%.

The results of the field assessments show that the homes in this study were of moderate hazard level with a low area hazard. The chance of a fire sustaining in the 100 meters area around the home was judged to be low but if the fire was to reach the home, most structures have a moderate potential of igniting. Conversely, a fire starting in a home or building has a moderate chance of sustained burning but a low chance of escaping past 30 meters around the home.

There were a few homes where the hazard classification was judged to be extreme. This was generally due to the roofing materials used in construction (wood shakes) but at times it was due to the vegetation surrounding the home. It was obvious that some homeowners had made no attempt to clear vegetation from immediately around their homes or outbuildings. Some of these sites had heavy loadings of natural grasses and shrubs adjacent to the home. At other times there was dead plant material, and other debris, sometimes in piles, in the vicinity of the home. This could be very dangerous when considering the fact that of those who have a fire pit, over 50% have the pit located within 10 meters of vegetation and almost 25% have it located within 10 meters of the home. A few homes were observed to have a fire pit immediately underneath the canopy of the surrounding vegetation. These homes are at risk from both fire moving within the vegetation to the home and from firebrands that could ignite the home directly or ignite the vegetation near the home. While these are examples of the extreme, there were also

properties where the homeowners had taken great care in hazard reduction. Whether the goal was to knowingly reduce hazards, or to create a landscape that was clean and open, these homeowners had created a property where fire hazard was low. The grass surrounding the home was mowed, vegetation was cleared around the home and ladder fuels in the surrounding vegetation were removed. Fire would have a difficult time igniting the home from moving along the ground unless fire spread is through aerial transport of embers (spotting).

4.9 Follow-up Survey

Response rates:

a. Group 1: 61 surveys sent out, 19 returned = 31%

b. Group 2: 67 surveys sent out, 38 returned = 57%

c. Group 3: 48 first surveys returned, only 25 individuals property owners made themselves available for field assessments, therefore only 25 surveys sent out, 15 returned = 60%.

Weights (Table 3) were calculated for each group prior to analysis.

Table 3. Weights were calculated for the 3 groups to account for uneven sample size after the second survey. The weighting factors were entered into the SPSS spreadsheet prior to analysis of the second survey results.

Group	Sample	% of Sample	2nd Sample	% of 2nd Sample	Weighting Factor	Weighted Sample Size
1	61	0.3987	19	26.39	1.5109	28.71
2	67	0.4379	38	52.78	0.8297	31.53
3	25	0.1634	15	20.83	0.7843	11.76
	153		72			

Group 1: X(19)=0.3987(72)
X=1.5109

Group 2: X(38)=0.4379(72)
X=0.8297

Group 3: X(15)=0.1634(72)
X=0.7843

Response rates for the second survey were fairly low which reduced the sample size for each group significantly. Group 3 was the most difficult group to maintain a reasonable sample size with. The initial 48 respondents were contacted by phone to arrange for field assessments. Some had moved between the original contact letter and the appointment for the field assessment. Others did not have phones or would not give their phone number. Others would not return messages asking them to participate. A total of 6 attempts were made to contact each respondent of Group 3 with successful field assessments being made on 25 properties. This was disappointing as the contact letter for Group 3 in the original survey explained that part of the treatment would include a field assessment. Only 15 respondents returned the second survey, which was a significant reduction in the sample size.

Response categories for the second survey were: Yes, No, Non-applicable (N/A's) or Plan to do in the Future. All 'yes' and 'plan to do in the future' responses were grouped. The N/A's were considered 'system missing' so that only those to whom the question applied were included in analysis for that question. For example, those respondents that did not have fire pits responded N/A when asked if they had relocated the fire pit. These respondents were excluded from analysis of this question by labeling them 'system missing' as the question did not apply to them.

Chi square values were determined (Appendix H) to find those questions that had significant results between groups. Eight of the 38 questions produced significant results. Group 2 was the only group to indicate they would purchase a security system that could detect fire. Group 1 indicated they were most likely to remove their fire pit completely, followed by Group 3. No members of Group 2 indicated they would remove their fire pit. Group 1 also indicated that they would remove their burning barrel, followed by Group 2. Group 3 indicated that they would not remove their barrels. Group 1 was most likely to remove vegetation within 30m of the home, followed by Group 2, then Group 3. Group 3 was more likely to change their siding and add an address sign followed by Group 2 then 3 for both. Group 2 was more likely to relocate their tools so that they were more accessible and no group said they would call elected officials to discuss fire concerns. The latter was an interesting result and the reasons could be varied. Residents may not feel that elected officials can answer their concerns, understand or have the power to change anything.

Variables were also grouped in two different ways to see if there was a pattern related to landscape, structure, expense or effort. Means were determined for each. A score of 1.000 would mean that all respondents would make all the changes. A score of 0.000 would mean that none of the respondents would make any changes.

Method 1: 3 groups formed

1. Changes to the inside of home and personal actions taken.

   11 variables were grouped (Q1, 2,3,27,28,29,31,32,33,35,36).

   Reliability α=0.6946.

2. Changes to vegetation and features on landscape.

   20 variables grouped (Q4, 5,6,7,8,9,10,11,12,13,14,15,16,17,19,20,25,26,30,34).

   Reliability α=0.8535.

3. Changes to structure.

   5 variables grouped (Q18, 21,22,23,24).

   Reliability α=0.5312.

   As reliability is low, changes to structure was not be analyzed.

This approach to the data lead me to conclude that the members of Group 3 (mean=0.798) were more likely to make changes inside the home and take personal actions, followed closely by Group 1 (mean=0.786). The response of Group 2 to this question was lower with a mean = 0.752 (Figure 15). Group 2 had the highest mean for

changes to vegetation and features on the landscape (mean = 0.875), Group 1 was second highest at 0.825, and the mean for Group 3 was last at 0.759 (Figure 16).

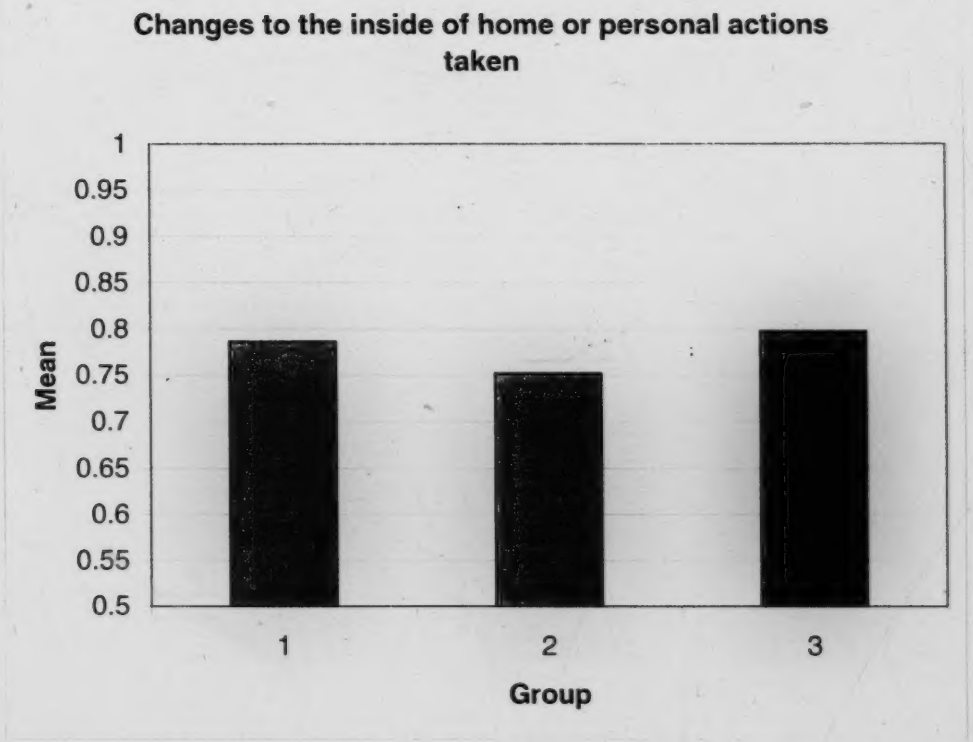

Figure 15. The means for all 3 groups for those respondents who have made changes within the home or have taken personal actions.

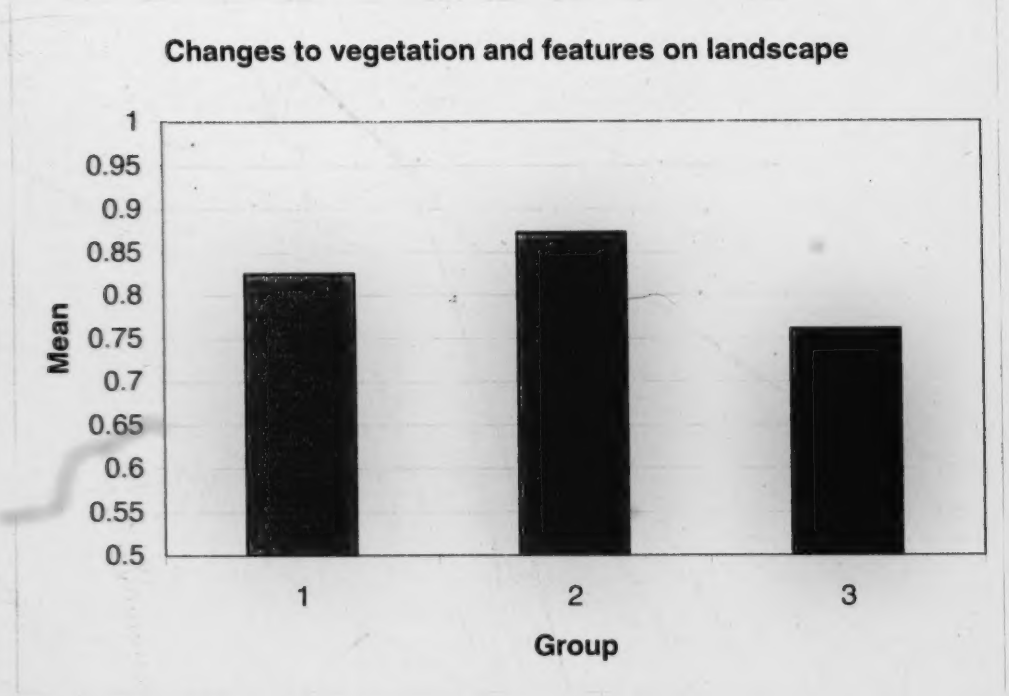

Figure 16. The means for all 3 groups for those respondents who have made changes to the vegetation and features on the landscape.

Method 2: 3 groups formed

1. Changes that are relatively easy and/or inexpensive

   26 variables grouped:

   (Q1, 2,3,5,6,7,8,10,11,12,13,14,15,18,19,20,26,27,28,29,31,32,33,34,35,36)

   Reliability α=0.8111

2. Changes that are radical and/or reactionary to fear

   5 variables grouped (Q4, 9,16,17,30)

   Reliability α=0.8481

3. Changes that are planned and effective in the long-term

   5 variables grouped (Q21, 22,23,24,25)

   Reliability α=0.5967

   As reliability is low, changes that are planned and effective in the long term was not be analyzed.

These results suggest that for changes that are easy and/or inexpensive, Group 3 had the highest mean of 0.835, followed by Group 2 at 0.812 with Group 1 at 0.762 (Figure 17). For changes that are radical/reactionary, Group 3 again solicited the greatest response with a mean of 0.8875. Group 2 was second at 0.8375 and Group 1 was again the lowest at 0.648 (Figure 18).

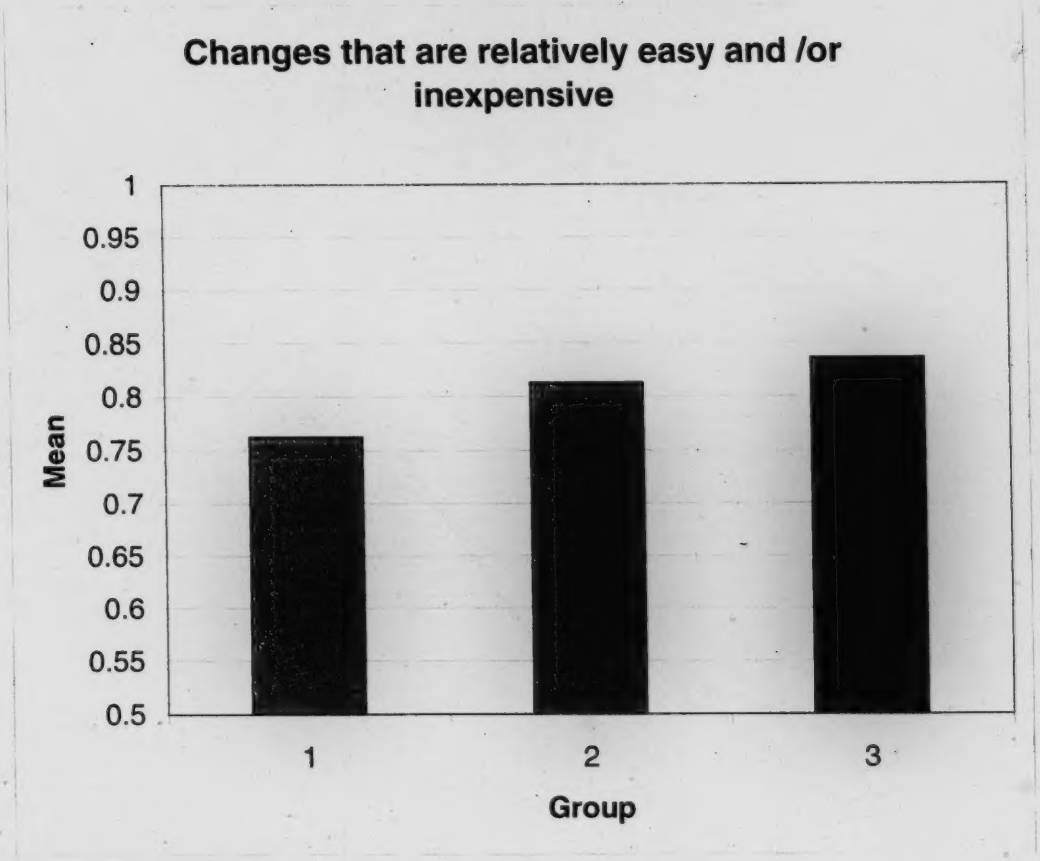

Figure 17. The means for all 3 groups for those respondents who have made changes that are considered easy and/or inexpensive.

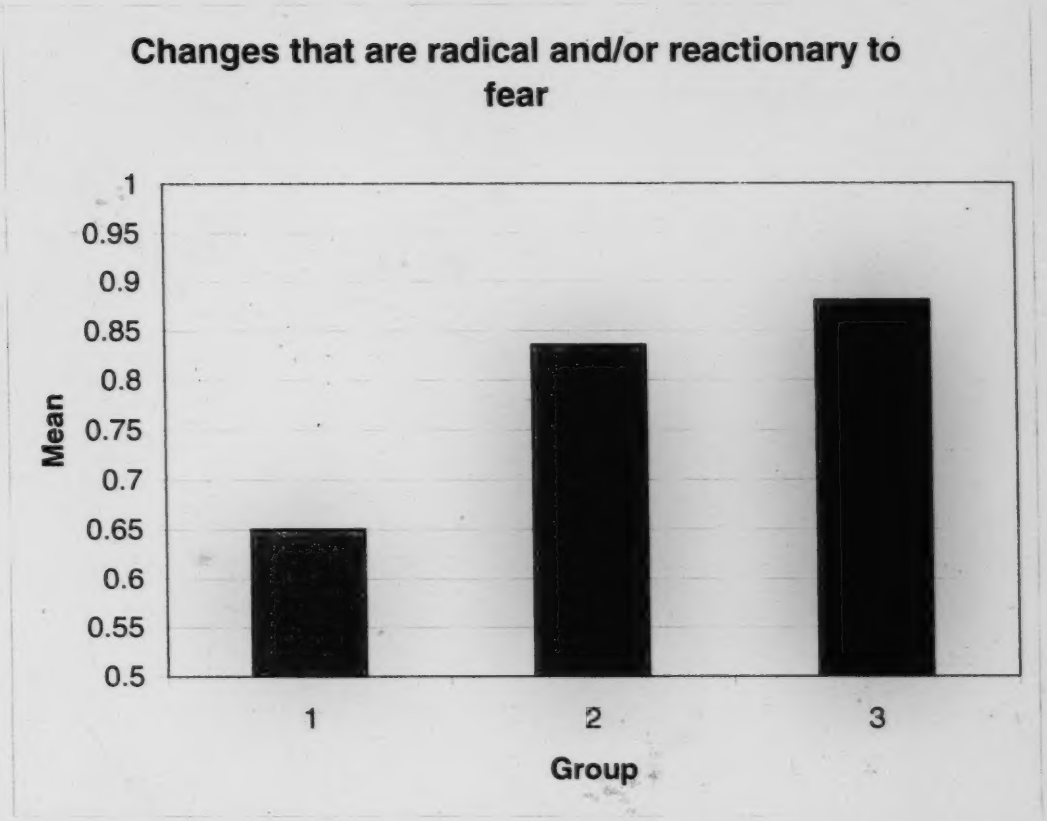

Figure 18. The means for all 3 groups for those respondents who have made changes that are considered radical such as the complete removal of a fire pit or vegetation.

5.0 Discussion

The largest fire in Alberta during the 2001 fire season started on May 23. The fire, which is believed to have started as a spark along a railroad line, became known as the Chisholm Fire. Along its path, at least 9 homes were destroyed and the province spent more than $7-10 million to fight this fire (Anonymous 2001). The local news media capitalized on the impact of the blaze and interviewed the affected residents extensively. The reaction of some of the residents was anger towards the Alberta Forest Protection, feeling that the province did not react quickly enough when the fire was first reported, and further that fire fighters did not try hard enough to save their homes. Others accepted their losses as part of the risk of living in the wildlands. The province eventually declared the area a disaster, which would allow the affected residents access to low cost government loans to rebuild. How will these residents rebuild their homes? Will they again use the same building materials? Will they landscape their properties as in the past? The most important component of this rebuilding process is the resident. Residential fire safety can be improved, but only when individual residents take responsibility for the factors that control the spread and heat associated with wildland fire. Homeowners must take primary responsibility for the survival of their homes from fire (Lavin 1996).

The situation in 2001 was not that much different than what it was in 1985 when over 1400 homes were destroyed by wildland fire in the United States (Laughlin and Page 1987). We knew then, as we know now, that wildfires will continue to occur. The toll in human life and property will continue to mount (Lavin 1996). The trend to move

away from the congested urban centers and into the aesthetically rich rural environment also continues. The fires that occurred in Redwater and Duffield, Alberta in 2002 confirm that property continues to be lost to wildfire.

Late July 2001, in central Strathcona County, a fire began in a greenhouse on a day when temperatures were in the high 20's (°C) and winds were gusting above 70km/h. The fire quickly spread to the home, then into some adjacent spruce trees between the home and the highway, and then across the four-lane divided highway into the farmer's field to the north. Firefighters were able to control the blaze but not before the greenhouse and home were destroyed. The farmer across the road also lost a large stack of hay bales. This is but another example of how fast fire can spread in the County.

The drought that occurred in Alberta created new difficulties for firefighters in Strathcona County during the 2002 fire season. Normally, deciduous dominated forests and cut farmers fields are assumed to act as natural firebreaks, thus slowing the spread and reducing the intensity of a wildfire. The drought caused the death of many trees and hastened the drying process of downed and dead material, making them available fuel for a fire. The fields were too dry to grow crops and any wild grasses present were dry also. Fields in this condition acted as a fuse, particularly when winds were high, and carried the fire from one stand to the next rather than acting as a firebreak, and starving the fire of fuel. Even aspen and poplar trees, known as the 'asbestos forest' for their resistance to fire were exploding into flames in the onslaught of a fire (Fechner and Barrow 1976).

Strathcona County has a growing population in the rural areas, with growth in 2000 of 3.3% and 6% since 1998. The residents in this County are well educated and have a good household average income of over $65 000 per year (CDN). This study of

Strathcona County residents represents baseline data for people residing in a mixedwood vegetation complex. The sample size of 176 respondents for the first survey is sufficient to give a clear indication of residents' attitudes and knowledge of fire. Questions on the first survey (Appendix B) were designed to ascertain information relating to various characteristics of the property, the homeowner, socio-economic status and the homeowners understanding of fire. From the responses it was evident that all respondents owned their properties and considered them to be their primary residence. This is important as it may lead the resident to have a personal stake in hazard reduction on their property. Nearly all property owners/respondents had some vegetation on their property, either coniferous, deciduous, or both. Additionally, grass was a common understory or surface fuel type. The average property size was 5.3 ha (12 acres). Most residents had a fire pit and a few used burning barrels to dispose of debris. This shows that most homeowners have used fire in some respect on their property at some time in the past. The responses to these questions and other questions give a picture of the types of properties represented in the sample. In short, these properties are of reasonable size with mixed vegetation that may partially obscure the home from the road. These would be typical homes found in any rural area within this vegetation (fuel) zone.

For most residents in Strathcona County, fire was not an important consideration when buying or building their home. Within the County there are some mixedwood (pine/spruce/poplar) stands and a large amount of grass-dominated lands that most residents don't consider as a fire threat. The spectacular wildfires that are commonly reported by the media occur in conifer stands where flame heights and behavior can be extreme. These types of stands are not commonly found in Strathcona County. More

importantly, the media rarely focuses on fast moving grass fires (unless they are local), with <2 m flame lengths, even though these less spectacular fires can be very destructive.

Experience with fire may affect ones perception of fire. Someone who has personally witnessed a forest or grass fire, felt the heat generated, smelled the smoke or watched it destroy a structure may feel very different about fire and its potential danger than someone who may have only seen a fire on TV. This exposure to fire may have had a positive influence on homeowners and the practices employed around their homes. Sixty-six percent of respondents in this study reported they had witnessed a fire in Strathcona County and over 50% have made modifications to their property to reduce the fire hazard. From on site inspections, it was clear that most properties are clean and well maintained, particularly near residences. Vegetation is regularly mowed around the structure, which can help reduce the fire hazard. This behavior was witnessed during all of my on-site visits. These behaviors may not be done solely to mitigate the effects of fire but they are known to reduce the impact of fire on residences.

When asked about how much the County spends on fire prevention and preparedness, most interviewed did not know though some indicated they felt it was the right amount. It is unclear if those who responded with "the amount was appropriate" actually knew the amount or whether they felt it was appropriate because in their mind there is not a foreseeable fire problem. Strathcona County Emergency Services prints many articles throughout the year expressing the need for fire permits or explaining the current fire situation. These are the articles that residents will see, articles explaining what preventable actions are, not what has happened. In reading these, residents may

assume that because everything seems 'alright', that the department must be spending the right amount of money.

Fire hazard reduction can work well when all adjacent properties have the same motivation. Fire hazard may not be a common topic of conversation between neighbors. In this County, neighbors may not know each other well enough to ask or even enough about fire prevention to notice what the other is doing. Almost 66% of the respondents reported they didn't know what their neighbors had done with respect to fire prevention activities. Therefore encouraging neighbors to communicate with each other could help reduce hazards as information and knowledge could be shared.

The attitude of residents in the W/UI can be the hardest thing to change especially if they don't see a problem. It was interesting to determine that the residents of Strathcona County felt that they are mainly responsible for their own safety and when given education on potential hazards they may face in the interface, they seemed willing to implement solutions. Winter and Fried (1997) found similar results to this study. In their survey of Michigan homeowners, most considered wildfire protection a shared responsibility, and 25% felt it was primarily the responsibility of the homeowner. Gardner et al. (1987) found the opposite in their study involving residents in San Bernardino, California. Homeowners there preferred policies that charge government agencies with full responsibility for hazard management. These differences could indicate a possible change in the attitudes of residents in the interface over time.

Understanding that many residents in rural Alberta feel responsible for their own fire safety, perhaps now is the time for the Alberta Legislature to dedicate more time, money and energy in educating residents. It would appear residents are willing to make

the changes necessary to protect their property if properly informed. Historical approaches have been directed at suppression efforts. Most recently, the province has purchased sprinkler systems in an attempt to protect private structures. This strategic approach to minimize fire damage would be greatly enhanced by effective interface measures such as defensible space and non-flammable building materials. Policy in Alberta is that the province will not pay for losses that could have been insured.

Winter and Fried (2000) asked residents in Michigan to rank 4 separate events that would pose some risk to them and the same question was used in this survey. Responses to this question would give an indication of how respondents would rank a potential fire destroying their home in relation to other events. All 4 events listed were possible occurrences and although tornadoes are not very common in Alberta, they do occur. One of the more devastating tornadoes in Alberta's history occurred July 31, 1987. Known as 'Black Friday', the tornado touched down between Edmonton and Strathcona County, caused millions of dollars in damage and killed 27 people (Edmonton Sun 1987). More than 50% of the respondents ranked a car accident that would send them to hospital followed by victim of robbery as first and second on their list. A wildfire destroying their home was ranked 3rd with the tornado destroying home last. The ranking order for these types of disasters by Strathcona County residents was the same as those in Michigan (Winter and Fried 2000). As there were only 20 grass and brush fires where buildings were exposed in the County from June 2001-June 2002, being a victim of wildfire is not a common occurrence. What has to be made clear to residents is that although fires may not be common, they do happen and could happen to them if reasonable precautions are not taken.

It is well known that the media can play a large role in shaping the attitudes and perceptions of the public. Newspapers, television, radio and the Internet are all tools that can be utilized to deliver fire-related information to residents of the interface in Strathcona County. Determining which tool is the most effective for communicating with County residents would give an avenue for educational information to reach residents in the future. Many respondents in this survey indicated that they read the local newspapers so this could be a medium that local officials could use to deliver educational information. Information on creating and maintaining defensible space and a FireSmart home could be included in these local newspapers or posted on the Strathcona County website. In addition, the types of programming people watch on television can influence their behavior. Most County residents watch some kind of nature programs that include information regarding forest fires. Watching programming such as this can expose viewers to the role of fire in nature. The connotation of the program where fires are shown could be either positive or negative, depending how the media represents it. The Internet can also be an avenue for education. The explosion of the Internet and personal computers in homes has lead to numerous web sites being devoted to issues related to the wildland/urban interface. Web sites such as www.firewise.org and www.partnersinprotection.ab.ca can teach users about how to live safely in the wildland-urban interface. Sites such as these give users detailed information on how to landscape their property, create defensible space, types of roofing and siding to use, even accounts from other homeowners on the benefits of Firesmart landscaping. Only a small number of respondents (less than 2%) however, have taken advantage of these fire prevention sites. This is unfortunate, as the very people these sites were intended to help are not

viewing the vast amount of homeowner-friendly information available. It is most likely that Strathcona County residents are unaware of these free resources and it may be worthwhile for web addresses such as these to be included in any fire prevention articles written for the local newspapers or posted on the local web-site.

A daily newspaper can also be an effective tool in communicating with residents in the interface. In Strathcona County, the local papers, "Sherwood Park News" and "Sherwood Park This Week", focus on stories relating to events and activities occurring in Strathcona County. Well-timed fire-prevention articles directed at interface dwellers may be successfully delivered using this method of communication. This method of fire safety promotion would also create awareness to any fire hazards that may exist and get people talking even if actual changes to property or behaviors do not occur.

Socio-economic information about residents of the W/UI can be important when attempting to change the behaviors of homeowners. Some changes can be expensive to implement, such as roofing or vegetation removal, and the ability to do them is likely affected by the property owner's income. Other changes may require a level of understanding affected by a homeowner's level of education. Acquiring this information for residents of Strathcona County could allow the results of this study to be compared to other surveys of W/UI residents nationally and internationally. Questions to determine the socio-economic information in this study were purposely placed at the end of the survey. As people do not easily divulge personal information, respondents may be more willing to answer these types of questions if you have developed a level of trust as a result of asking the previous questions. A few respondents did refuse to answer questions specific to: income level, education and type of employment. Instead they wrote in

comments stating that they found these types of questions as intrusive or of no value. It was expected before the survey was administered that some respondents would be offended by these questions. Residents in this survey are well educated as almost 80% have some post secondary education. Many are employed and the household income is moderate. Understanding prevention education should not be a concern with these respondents however time and expense may be an issue. As many are employed outside the home or retired, they may not have the physical capabilities or time to implement some of the physically intensive changes. Other changes such as roofing or siding material or vegetation removal can be a large expense that would need to be planned for completion in future years. Many respondents did not indicate a reason for the delay when responding that they plan to make changes in the future during the second survey so it is unclear if these socio-economic factors were a contributing factor to these respondents.

Response times to fires, and potentially any damages are greatly decreased when fire crews are notified quickly. As most people work away from home, fire starts that occur during the day may go unreported initially if there is no one around to see it. Almost 66% of the properties sampled reported that someone was in or around the household during the day. If this person is of the age and the capacity to alert the fire department to any danger, then reporting time will be quicker and resulting damages are likely to be reduced.

The involvement of the fire department can influence the behavior and attitudes of homeowners. Davis (1990) found that community meetings did not attract the residents but rather other firefighters. A proactive approach from fire officials can remind

homeowners of the fire departments knowledge and the ability to assist homeowners to live safely in the W/UI. Strathcona County fire officials regularly place articles in the local papers and on the County's web site reminding residents of the need for fire permits and other fire danger information. This reiterates to residents the existence of the fire department and the services they provide. A few Strathcona County residents indicated on the first survey of this study that they had contacted the fire department for personal property evaluations. This behavior is positive for both the fire department and the homeowner because through this interaction the fire department learns more about the types of property requiring protection and the homeowner has an opportunity to learn first-hand about their specific fire problems. Additionally, this interaction/dialogue can create a positive rapport between fire officials and homeowners. These homeowners were obviously interested in increasing their safety. Other respondents in this study indicated that no preparation had been done at all in terms of fire safety and there are a number of reasons for doing nothing. For some, it may have been a deliberate decision, as they may not feel fire is a threat while others may be apathetic because they know they have homeowners insurance. Others may have done nothing as they may not know what to do, didn't know how to do it or who to contact to assist them. The local fire department could promote this service through various methods such as the local papers to encourage homeowners to contact them for advice.

The questions in the first survey were designed to promote thought and consideration of fire as an issue of real importance to them. Asking residents if their property would burn, or if they had made modifications because of the fire hazard requires them to think of their structures, their vegetation and their habits. Asking

homeowners if they have a screen on their fire pit may influence them to purchase and use one, as they might not have realized this simple and inexpensive act could help prevent firebrands from escaping (of the 78% which have fire pits, 46% of them have screens). Some homeowners may not have even known that screens exist for such purposes. Legislation requiring the use of screens on both fire pits and burning barrels could ensure that all homeowners are taking this precaution. The fact that issues and subjects that people may not normally think about were questioned during the first survey makes it an educational tool in itself.

Partners in Protection and the Alberta Lands and Forest Service (now the Sustainable Resources Development Department) provided the actual educational materials given to Group 2 and Group 3 (Appendix B). The Partners in Protection information consisted of a 2-page, double-sided information sheet that explained some wildfire issues and encouraged residents to create a plan before a wildfire approached. It also provided instruction on what to do when a fire occurs. Firesmart landscaping, building materials and homeowner behaviors were also discussed in an easy to follow, checklist type format. The survey may have provoked some thought into fire hazard and safety but the addition of the brochures would have given more detailed information on fire and potential solutions to the hazards. Understanding how the hazard exists is extremely important for the homeowner if they are to make any changes and the brochure will help explain aspects that the homeowner may not understand or give them contact information to organizations that can answer their questions. The addition of a field assessment gave respondents the opportunity to discuss any concerns they might have arising from the survey or the information provided and to have an in-person evaluation

of their property. Any potential hazards that were not mentioned during the on-site inspection could be discussed during the assessment, which was the final on-site act. Of particular note was that most respondents in the survey had wooden decks attached to their homes and most of these decks were not skirted in. Many had not considered the hazard that could be caused by natural debris, such as leaves and dead grass, accumulating underneath these decks. Other factors, which were commonly discussed were landscaping and slope. In general, the field assessment gave the interviewer the opportunity to assess individual properties in a personable way and to share with the homeowner specific strategies for reducing the probability of loss due to wildfire. A few respondents recounted incidents of fire in adjacent properties from various ignition sources and a few told of fires, that they themselves had started, which had escaped control. Most respondents felt the field assessment was a benefit and as the results show that respondents in Group 3 tended to have the greatest increase in the awareness of fire (though not statistically significant), this act may well be worth the time and expense required. Further research with larger sample sizes would be needed to show if this pattern is correct. Field assessments can be costly in comparison to simple mail-outs. The cost of transportation and interviewer time (generally about one hour) can quickly add up when a number of assessments are performed.

Roadside observations were done to confirm some of the responses on the survey and to examine other characteristics. Driveway width and the presence /absence of a gate can be crucial for the fire authorities when responding to a call. Emergency vehicles may have difficulty accessing a property if a gate is closed or the driveway is too narrow for large trucks. Another potential delay for fire officials is finding the property easily.

There were a number (35%) of properties that were found to have address signs that were parallel to the road or address numbers that only appeared on one side of the sign. Signs with these attributes can all lead to a potential delay in response from Emergency Services. The County could implement mandatory address signs that are visible from both directions of travel along the roadway. This would allow for the Emergency Services vehicles to find the property easier and would also allow for the general public that may come across a fire to report its' exact location. Some homes, when within a subdivision, do not have mailboxes, rather mail is delivered to a common location. These homes could be encouraged to place address signs at the entrance to their property. Subdivisions could be required to state the actual address at the entrance to the subdivision, rather than just the subdivision name, as is the case with most. Regulating driveway gates could be a problem as residents receive reduced insurance rates for having a locked gate on their property. Although gates can cause a time delay in response, this is a safety mechanism for homeowners and implementing any regulations would have to be carefully considered by elected officials.

The second survey addressed specific behaviors of the respondents. All '*yes*' and '*plan to in the future*' responses were combined into one positive response. This allowed for those respondents that had intentions on making changes to not be penalized for the fact that they had not been implemented at the time of the second survey. Measuring if the changes had actually been made in the future would be difficult to monitor and was beyond the scope of this study. The important point for this study was that the respondent had actually made or had intentions to make changes. Questions on the second survey were also related to themes of human behavior. As the sample sizes were

small, significance was not achieved between the behaviors but trends will be identified as future studies may find similar results. Group 3 was more likely to make changes inside the home and to take personal actions and Group 2 had the highest mean for changes to vegetation and the landscape. The field assessment for Group 3 may have influenced those members to become more aware of their neighbors as a walk through the property occurred and therefore to change their burning habits. Group 1, which had only the survey, was second. The survey may have influenced that group to consider fire and encouraged them to start watching their neighbors and their own habits. Group 2 had the same written information as Group 3 and felt they would concentrate their efforts on the landscaping and vegetation. The educational information included methods for vegetation modification that could be implemented to reduce fire hazard. Perceptions of vegetation hazards may have been reduced for Group 3 after the field assessment, as the average area hazard was low. This could be the reason for them having the lowest mean for changes to landscape. Group 3 had the highest mean for both the changes that were easy/inexpensive and radical/reactionary. They were prepared to make changes in their personal actions similar to those in the first set of behaviors but was also more likely to remove those hazards present on the landscape such as the fire pit and vegetation. Although Group 3 received the same educational information as Group 2, the field assessment may have persuaded this group to concentrate their efforts on removing the visible and obvious hazards on the landscape that were identified during the assessment.

One of the goals of this study was to create awareness in residents of the wildland/urban interface about the possibility of wildfire affecting themselves and their property. How residents view the potential of wildfire is extremely important when

analyzing their behaviors. A person that feels wildfire is no threat will behave differently than someone who is concerned. Those respondents who felt fire was not a danger may also feel their properties would not burn. The perception/awareness variable rates how respondents view the threat of fire on their property. If there are potential ignition sources due to poor landscaping practices or building materials, then the potential, in the presence of fire, for damage is very real. Those respondents who felt fire was not a threat may not understand how their behaviors and practices may increase the potential for damage; their perception is one of indifference to wildfire. The second survey asked respondents if they felt they were more aware of potential fire hazards on their property since completing the survey. Combining all responses on the second survey, regardless of group, showed a positive response. This result indicates that administering this survey was a successful endeavor. Respondents, regardless of treatment type, did receive information that increased their awareness of fire on their property. Individually, Groups 2 and 3 were higher than the initial average while Group 1 was lower (though not significant, results are presented to indicate the trends found). Group 3 had the greatest increase in awareness, possibly because of the treatment type. The personal communication and interaction with an assessor who could explain any hazards and answer any questions may have aided in this increased awareness. Group 1, having received no educational information other than the initial survey may have felt they were no more aware of hazards now than before, or may now have more questions which could explain their awareness being less than the initial value.

There is some realization of fire potential by respondents as evidenced by the fact that over half had made modifications to vegetation on their property to reduce fire

hazard. A concern that was noticed during the field assessments was that although residents had cleared the vegetation around the home, there was, in a number of cases, vegetation within 10m on one side of the home. This vegetation was generally not thinned and consisted of tall undergrowth and deciduous trees. Some of the trees were in poor health, with rot and decay visible. A fire at the base of these trees could assist in the structural failure of these trees. Even without fire, these trees are hazardous to the home and could cause significant damage if the tree falls. The construction of the home near these native stands may have weakened the root structure and has opened the stand to light which increases the amount of undergrowth and therefore increases the amount of flammable vegetation present in the vicinity of the home.

The three different levels of education did show that some education does have a positive effect on residents but because the sample sizes were small, no definitive statements can be made regarding the treatments. Awareness did increase for the groups that received more that just the survey and increased even higher for those who participated in the field assessment. The first survey alone has caused the respondents to think about their properties in relation to fire as evidenced by the increase in awareness. Also, numerous comments were received from the respondents that this study encouraged them to talk to their family, become more aware of their neighbors and examine their own habits around their home. Many asked for the results to be published in the local papers so the entire population of the county (or at least those who read the paper) could learn about the project and some of the findings. This could encourage community groups to become involved and begin assessing their community as a whole, instead of individual properties.

The study was not without difficulties and surprises. It was thought that Group 3 would have the highest response rate because they were getting a measurable good (the field assessment) and that Group 1 would be the lowest as all they were getting was a survey (Fowler 1993). Group 3 was surprisingly the lowest. Group 2 had the highest response rate followed closely by Group 1. There are a number of reasons this could have happened. Respondents may have not wanted anyone on their property to critique how they live or felt an assessment was a burden on their time. Also, the interviewer represented themselves as both a researcher and an employee of Strathcona County. It was felt that by being an employee, this would give some credibility to the assessments, beyond that of a university researcher. This may have made some respondents feel that the local government was 'checking up' on them, or that the findings would be reported to local authorities. Although it was stressed that all results, as they pertained to specific identities and properties, were confidential and would not be released, this could have affected return rates. The lack of information provided to Group 1 could have affected the return rate for the second survey. Respondents may have felt that they have done one survey and received nothing, so why would they do a second. The most disappointing response for the project was those respondents in Group 3 in regard to the field assessments. The initial contact letter explained to them that a field assessment would be done and it was expected that a majority of those that responded would continue their participation in the project. Only half could be contacted for assessments and only 15 returned the second survey, even after extensive follow up. The low response rates made data analysis on specific behaviors difficult. This study, done in a more fire prone environment might have enjoyed higher response rates for both the first and second

survey though the response rates for the first survey in this study were good for a mail survey. What this study did address is the habits and attitudes of those residents who reside in this vegetation type. With the overall increase in awareness, some may change their behaviors in order to reduce hazards. Even cleaning the gutters one more time per year, or moving their woodpile a few more meters away from the home could help reduce damages that may be caused by a fire. Further research is needed to confirm the results and trends found as a result of in this study. A larger initial sample size will be required to ensure the size of the treatment groups after the second survey is adequate to perform the necessary statistical analysis. Another difficulty was that all the area hazard assessments during the on-site visits were classified as low which may indicate that the hazard assessment form from Partners in Protection may not have been the best one to use. The amount of dried grasses and other vegetation present during times of drought may be underestimated and the soil type is also not considered. An assessment form, which focused on a hardwood-dominated landscape, could be designed to differentiate hazard levels between homes in this landscape. This form may change the hazard rating of some properties in Strathcona County and give a better indication of the different hazard conditions present.

6.0 Conclusion

This study showed that residents of the wildland/urban interface could be influenced to change their behaviors when provided with the information materials that enabled them to select between fire safe alternatives. Simply making the effort of

mailing information on fire behavior or methods to make a 'Firesmart' home can encourage a homeowner to make changes on their property to reduce hazard. Awareness of fire potential was raised even greater when personal visits were made to individual homes. The risk of catastrophic wildfire is generally not high for Strathcona County because of the vegetation type and the fact that many residents have properties with a low fire hazard. Small, simple changes such as relocating a fire pit can reduce this hazard even more. This hazard will remain low if residents continually maintain 'Firesmart' properties. It is important that complacency does not become a factor as fire can and will occur. Strathcona County can also do some things to assist residents in reducing the fire hazard and increasing the effectiveness of the Emergency Services Department. Such things could include:

1. As previously mentioned, address signs could be made mandatory in a manner that is visible from all directions.
2. Subdivisions could be required to state the full address at the entrance.
3. Emergency Services Department should be encouraged to continue their practice of placing articles regarding fire conditions in local papers. These should include information on creating Firesmart properties and the benefits of this. A community liaison who would work directly in educating homeowners about fire hazards and how to reduce them may prove beneficial.
4. Create a link on the local website to the various wildland/urban interface websites that can educate users on living safely in the interface.
5. Establish a structured program with local residents where they can have their property evaluated.

6. Restrict and monitor the use of burning barrels and fire pits, particularly the placement of the barrel or pit in relation to vegetation. All such burning implements should be required to be equipped with screens.
7. Increase fines or increase the media exposure when fines are issued. This could potentially be a deterrent for those that are not currently aware of the consequences of what could happen when burning irresponsibly.
8. Emergency Services could work with other departments such as the Parks Department to reduce fuel loads in urban parks when they are adjacent to private property. Also, to have input into new housing developments throughout the County to ensure that reasonable fire hazard reduction precautions have been taken prior or during development. This would also give them the opportunity to convince (or require) homeowners to allow their homes to be accessible in the event of a fire.
9. Train more staff in wildland fire fighting. There is a large difference in structural vs. wildland fires and personnel should be comfortable and well trained regardless of the type of fire encountered.
10. Emergency Services could work with the Partners in Protection group to develop a hazard assessment form that is focused specifically on hardwood-dominated forests.

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Cover letter sent to each group and first survey, sent to all respondents, regardless of group.

Letter to be sent to GROUP 1 – survey only

Dear Home Owner,

My name is Ms. Louise Stewart. I am a forest fire science graduate student in the Department of Renewable Resources, and I am also an employee in the Department of Recreation, Parks and Culture of Strathcona County. Over the next _____ weeks I will be administering a survey, which will attempt to assess the fire hazard affecting private property in the County.

As a resident living in the "wildland/urban interface" or next to an urban park, which contains natural stands of vegetation, you have been randomly selected to participate in a research study that will attempt to examine the potential fire danger on and around your property. Selection for this study does not necessarily mean your property is in danger of burning.

You are asked to fill out the attached survey and return it in the envelope provided. A follow up survey will be sent out later in the summer. Participation in this project requires a commitment from you to answer, as truthfully as possible, the questions on both the initial survey and the follow up survey and to return them within the requested time frames.

This research is necessary to determine the fire hazard in Strathcona County and to identify the potential damages that could be caused by such events. It has the full support of Strathcona County Emergency Services Department. Strathcona County will receive a summary of results upon completion of the entire study.

Thank you in advance for your time and please contact us if you require further information.

Sincerely,

Ms. Louise Stewart, B.Sc. Forestry
Leadhand – Arboriculture, Strathcona County, Recreation Parks and Culture
(780) 467 – 2211

Dr. P.M. Woodard, Professor
Department of Renewable Resources, University of Alberta
(780) 492 - 9053

Mr. Don Polinski
Park Maintenance Supervisor, Strathcona County, Recreation, Parks and Culture
(780) 464 – 8492

Letter to be sent to GROUP 2 – survey, brochure, checklist

Dear Home Owner,

My name is Ms. Louise Stewart. I am a forest fire science graduate student in the Department of Renewable Resources, and I am also an employee in the Department of Recreation, Parks and Culture of Strathcona County. Over the next _____ weeks I will be administering a survey, which will attempt to assess the fire hazard affecting private property in the County.

As a resident living in the "wildland/urban interface" or next to an urban park, which contains natural stands of vegetation, you have been randomly selected to participate in a research study that will attempt to examine the potential fire danger on and around your property. Selection for this study does not necessarily mean your property is in danger of burning.

You are asked to fill out the attached survey and return it in the envelope provided. A follow up survey will be sent out later in the summer. Also included in this package is a brochure explaining potential hazards on your property and solutions to them as well as a checklist for you to use and keep which is intended to give you a better understanding of your property. Participation in this project requires a commitment from you to answer, as truthfully as possible, the questions on both the initial survey and the follow up survey and to return them within the requested time frames.

This research is necessary to determine the fire hazard in Strathcona County and to identify the potential damages that could be caused by such events. It has the full support of Strathcona County Emergency Services Department. Strathcona County will receive a summary of results upon completion of the entire study.

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Department of Renewable Resources, University of Alberta
(780) 492 - 9053

Mr. Don Polinski
Park Maintenance Supervisor, Strathcona County, Recreation, Parks and Culture
(780) 464 – 8492

Letter to be sent to GROUP 3 – survey, brochure, checklist, field evaluation

Dear Home Owner,

My name is Ms. Louise Stewart. I am a forest fire science graduate student in the Department of Renewable Resources, and I am also an employee in the Department of Recreation, Parks and Culture of Strathcona County. Over the next _____ weeks I will be administering a survey, which will attempt to assess the fire hazard affecting private property in the County.

As a resident living in the "wildland/urban interface" or next to an urban park, which contains natural stands of vegetation, you have been randomly selected to participate in a research study that will attempt to examine the potential fire danger on and around your property. Selection for this study does not necessarily mean your property is in danger of burning.

You are asked to fill out the attached survey and return it in the envelope provided. A follow up survey will be sent out later in the summer. Also included in this package is a brochure explaining potential hazards on your property and solutions to them as well as a checklist for you to use and keep which is intended to give you a better understanding of your property. Participation in this project requires a commitment from you to answer, as truthfully as possible, the questions on both the initial survey and the follow up survey and to return them within the requested time frames.

After the initial survey has been returned, a field evaluation will be conducted by myself and an assistant using the "Partners in Protection Hazard Assessment Form", which examines various aspects of your property such as the type of vegetation surrounding your home. This will be done with you and will aid in understanding the goals of the project

This research is necessary to determine the fire hazard in Strathcona County and to identify the potential damages that could be caused by such events. It has the full support of Strathcona County Emergency Services Department. Strathcona County will receive a summary of results upon completion of the entire study.

Thank you in advance for your time and please contact us if you require further information.

Sincerely,

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Mr. Don Polinski
Park Maintenance Supervisor, Strathcona County, Recreation, Parks and Culture
(780) 464 – 8492

First Survey

Analyzing the Wildland/Urban Interface in Strathcona County

Please have the homeowner or permanent resident answer the following questions by circling the correct response or filling in the blank when necessary. If you choose not to answer a question, leave it blank and go to the next question. This questionnaire should take about 30-40 minutes to complete.

1. How long have you lived on your property?
   - **1) 0-1 years**
   - **2) 2-5 years**
   - **3) 6-10 years**
   - **4) More than 10 years**

2. Do you consider this to be your primary residence?
   - **Yes**
   - **No**

3. Have you lived on a farm or acreage before your current home?
   - **Yes**
   - **No**

4. Do you own or rent this property?
   - **Own**
   - **Rent**
   - **Other**

5. How large is your property?

   (hectares/acres)_____

6. Did you build any of the structures/buildings on your property yourself?
   - **Yes (all)**
   - **Yes (some)**
   - **No (Got to Question 8)**

7. Did you consider the flammability of the materials used when you were building?
   - **Yes**
   - **No**
   - **Sometimes**

8. Please circle each of the tree species on your property

   Spruce **Pine**
   Poplar **Aspen**
   Ash **Maple**
   Birch **Elm**
   Others

9. On a scale of 1 - 7, with 1 being no danger and 7 being extreme danger, do you feel the plants and trees surrounding your home present a fire danger?

   1 2 3 4 5 6 7
   No danger **Extreme**

10. Did you consider the risk of wildfire when you moved into your home?
    - **Yes**
    - **No**

11. Do you believe that if these plants or plant communities were to catch fire, that this fire would cause your buildings to burn?
    - **Yes**
    - **No**
    - **Don't know**

12. Have you ever witnessed a forest fire?

Yes
No (Go to Question 15)

13. Was it out of control?

Yes
No
Don't Know

14. Where was it located?_____
(be as specific as possible i.e. Province, County, Name of Forest etc.)

15. Have you ever seen grass or shrub fires within Strathcona County?

Yes
No (Go to Question 19)

16. How many?

A. 1-2
B. 3-4
C. 5 or more

17. Were structures/buildings destroyed?

Yes
No
Don't Know

18. Were human lives lost?

Yes
No
Don't Know

19. Do you feel wildfire is a threat to your home?

Yes
No
Not sure

20. Have you ever made modifications to the vegetation around your property in an attempt to reduce the potential fire danger to your house or other structures?

Yes
No

21. Do you regularly mow the lawn surrounding your house so that the grass is never taller than 10 cm in height?

Yes
No
Sometimes

22. Do you regularly mow the lawn surrounding the other buildings (barns, sheds etc.) on your property so that the grass is never taller than 10 cm in height?

Yes
No
Sometimes

23. Do you have a fire pit?

Yes
No (Go to Question 28)

24. Is there a screen (wire mesh) on the pit?

Yes
No

25. How far from vegetation (shrubs and trees) is the fire pit?

    1) **less than 10 meters away (less than 30 feet)**
    2) **10-15 meters away (30-45 feet)**
    3) **Greater than 15 meters away (greater than 45 feet)**

26. How far from a structure (house or out building) is the fire pit?

    1) **less than 10 meters away (less than 30 feet)**
    2) **10-15 meters away (30-45 feet)**
    3) **Greater than 15 meters away (greater than 45 feet)**

27. Do you burn leaves and other debris in this fire pit?

    1) **Usually**
    2) **Sometimes**
    3) **Rarely**
    4) **Never**

28. Do you have a burning barrel?

    Yes
    No (Go to Question 33)

29. Is there a screen (wire mesh) on the barrel?

    Yes
    No

30. How far from vegetation (shrubs and trees) is the burning barrel?

    1) **less than 10 meters away (less than 30 feet)**
    2) **10-15 meters away (30-45 feet)**
    3) **Greater than 15 meters away (greater than 45 feet)**

31. How far from a structure (house or out building) is the burning barrel?

    1) **less than 10 meters away (less than 30 feet)**
    2) **10-15 meters away (30-45 feet)**
    3) **Greater than 15 meters away (greater than 45 feet)**

32. Do you burn leaves and other debris in this burning barrel?

    1) **Usually**
    2) **Sometimes**
    3) **Rarely**
    4) **Never**

33. Do you have fire insurance?

    Yes
    No
    Don't know

34. Have you ever been denied fire insurance?

    Yes
    No
    Don't know

35. How visible is your house from the road when the trees do not have leaves?

1) **Clearly visible**
2) **Partially visible**
3) **Not visible**

36. Are the address numbers on your address sign (by road/end of driveway):

1) **less than 5cm (less than 2 inches) in size?**
2) **5cm (2 inches) or larger**
3) **Don't have an address sign**

37. Is your address sign located on your mailbox?

Yes
No (Go to Question 39)

38. Are the address numbers on your mailbox:

1) **less than 5cm (2 inches) in size?**
2) **5cm or larger**
3) **I don't have numbers on mailbox**
4) **Mail is delivered to another location located off property.**

39. Are the address numbers on your house

1) **less than 5cm (2 inches) in size?**
2) **5cm or larger**
3) **I don't have numbers on the house.**

40. Where do you keep your firewood?

1) **inside your home**
2) **within another structure such as a shed.**
3) **outside and stacked next to a building**
4) **outside and away from all buildings**
5) **other location not already mentioned**

(describe)_____

6) **I don't store firewood**

41. How often do you clean your gutters on your house?

1) **less than once per year**
2) **one time per year**
3) **two times per year**
4) **three times per year**
5) **more than three times per year**

42. What material is the roof of your house made of?

1) **Metal**
2) **Tar paper**
3) **Tile**
4) **Asphalt**
5) **Fire resistant treated wood shakes**
6) **Untreated wood shakes**
7) **Other (describe)**

_____

8) **Don't know**

43. What type of siding do you have on your house? (if more than 1 type, choose the one that is the majority of your siding)

1) **Stucco**
2) **Vinyl siding**
3) **Wood**

4) **Metal**
5) **Brick**
6) **Other (describe)**

_____

7) **Don't know**

44. How would you rate the amount spent by Strathcona County on fire prevention/preparedness?

1) **Too much**
2) **Just about the right amount**
3) **Too little**
4) **Don't know**

45. At what level have your neighbors invested in personal fire prevention efforts as compared to you?

1) **More**
2) **About the same**
3) **Less**
4) **Don't know**

46. Who do you feel is ultimately responsible for protecting homeowners from wildfires in Strathcona County?

1) **100% homeowners**
2) **75% homeowners, 25% Strathcona Co.**
3) **50% homeowners, 50% Strathcona Co.**
4) **25% homeowners, 75% Strathcona Co.**
5) **100% Strathcona County**
6) **Don't know**
7) **Your preferred ratio, if not listed above:**

Homeowners _____%

Strathcona Co._____%

47. Do you feel property taxes in Strathcona County are:

1) **Too high**
2) **Between too high and the right amount**
3) **Just about the right amount**
4) **Between too little and the right amount**
5) **Too little**
6) **Don't know**

48. Each of these events poses some risk to you. Rank these events from 1 – 4 with 1 being the greatest risk and 4 being the least risk.

- _____ **a tornado destroys your home**
- _____ **a car accident sends you to hospital**
- _____ **being a victim of a burglary or robbery crime**
- _____ **a wildfire destroys your home**

In an attempt to better understand what method of communicating information about forests, forest fire and protecting homes in the wildland/urban interface would best reach you, please answer the following:

49. Have you ever watched programs on television regarding forest fires?

Yes

No

50. Do you watch nature programming?

a) Always

b) Sometimes

c) Rarely

d) Never

51. What networks do you watch regularly? (circle as many as appropriate)

1) CTV

2) CBC

3) ITV

4) A-Channel

5) The Learning Channel (TLC)

6) The Discovery Channel

7) Access

8) Life Network

9) Outdoor Life Network

10) CBC NewsWorld

11) TSN/Sportsnet

12) Public Broadcasting (e.g. KSPS – Spokane)

13) Other (please specify)

_____

_____

_____

52. Do you use the internet?

1) Often

2) Sometimes

3) Rarely

4) Never (Go to Question 54)

53. Have you ever explored the various forest fire information sites available on the internet?

Yes

No

54. Do you read a daily newspaper?

1) Often

2) Sometimes

3) Rarely

4) Never (Go to Question 57)

55. Is the newspaper delivered to your home?

Yes

No

56. What sections do you read regularly? (circle all that apply)

1) World news

2) Provincial/Regional news

3) Sports

4) Life

5) Entertainment

6) Classified

7) Humor

8) Other (please specify)

_____

____

57. Do you read local papers, such as the Sherwood Park News or Sherwood Park This Week, regularly?
    1) **Often**
    2) **Sometimes**
    3) **Rarely**
    4) **Never**

58. Which magazines do you read regularly? (Please list)

    _____

    _____

    _____

    _____

    _____

59. Are you **Female**
    Male

60. How old are you?
    1) 18-30
    2) 31-40
    3) 41-50
    4) 51-60
    5) 61-70
    6) 70+

61. What is the highest level of education you have received?
    1) **Some high school**
    2) **Completed high school**
    3) **Some technical school or college**
    4) **Completed technical school or college**
    5) **Some university**
    6) **University**
    7) **Other**

62. What is your current level of employment?
    1) **Employed (at home)**
    2) **Employed (outside the home)**
    3) **Retired**
    4) **Other (explain)**

    _____

    _____

63. Is there <u>normally</u> someone over the age of 18 at home during the day?
    Yes
    No

64. What is the average annual income of your household?
    1) **Less than $30,000**
    2) **$30,001 - $45,000**
    3) **$45,001 - $60,000**
    4) **$60,001 - $75,000**
    5) **$75,001 - $90,000**
    6) **More than $90,000**

65. How many people currently live here?
    18 years old or older

    _____

    Under 18 years old

    _____

66. Would you like to receive a summary of the results of this research when the analysis is completed?

Yes

No

---

67. Have you done anything in preparation for a potential fire (wildfires or fires that may start in a building)? Examples include fire insurance or a security system that detects a fire and calls the fire department for you. Please elaborate.

68. What would you do if you heard of a fire in an area near your property? Who would you call?

If you have any additional comments or would like to clarify any of your answers, please use the back side of the survey.

Thank you for completing this questionnaire, your responses are valuable to this study. Please return it in the envelope provided.

Educational materials distributed to those members of Groups 2 and 3.

1. **Wildfire – A disaster waiting to happen. (Partners in Protection)**
2. **Wildfire – Be prepared. (Partners in Protection)**
3. **Wildfire – Check it out. (Partners in Protection)**
4. **Protect Your Forest Home From Fire. (Alberta Environment)**

Wildfire

A Disaster Waiting to Happen!

Living with Fire

Whether near large urban areas or in remote rural locations, every year more and more people are retreating to peaceful surroundings and building their homes in the "wildland/urban interface" (areas where the community meets grassland or trees). Living in these areas means living with fire.

Fire isn't always bad — it's nature's way of recycling and rebuilding, but in high value areas, like the wildland/urban interface, wildfires are not desirable. Effective fire prevention messages, as well as the development of modern firefighting equipment and techniques, have led to strict controls that shut fire out of many forest and grassland areas. Most governments have implemented forest management programs to help combat the problem, but the fact remains that forests are becoming older, more closed in, and loaded with fuels (vegetation). If a fire ignites in an area with lots of fuel when the weather conditions are hot, dry, and windy, it can be extremely intense and difficult to control.

To tackle wildfire issues, seven disciplines have been designed to make forest or acreage living safer for homeowners. The disciplines are:

- ✔ Education - educating people living in forest or grassland areas about precautions they can take.
- ✔ Fuels Management - keeping the home safe by thinning, pruning, and removing trees, branches, and deadfall that can fuel a fire.
- ✔ Legislation - involving development (e.g. homes in forested areas should be required to have a sprinkler system).
- ✔ Development - guidelines can be set up by builders and developers to make developments fire smart.
- ✔ Planning - implementing restrictions or guidelines (e.g. roads and driveways should be wide enough to support a fire truck).
- ✔ Training - cross-training firefighters who tackle forest fires and extinguish house fires.
- ✔ Inter-agency cooperation - municipal volunteer fire departments working together with forest firefighting resources.

The Problem

Wildfire is one of the most powerful forces in nature. Many residents in Canada have lost their homes to wildfire. Many have also been injured or evacuated from their homes and communities when fire has threatened their safety. Fortunately, the number of losses related to wildfire incidents in Canada is small in comparison to floods or other disasters. This can be attributed to good fortune and the fact that most wildfires have occurred in low or non-populated areas. Unfortunately these statistics can change at the strike of a match. It's only a matter of time before a number a tragic wildfires plague Canada.

The Solution

While the fury of a wildfire may be frightening, it's a reality that every community must deal with. Wildfire is a community problem that needs a community solution. It will take the efforts of political leaders, community planners, and members of the public and private sector to solve wildfire issues.

During a wildfire there may not be as many firefighters as there are homes in need of protection. While firefighters defend one home, the fire's perimeter may rage on, threatening many more structures and burning acres of vegetation. Residents cannot solely rely on firefighters to save their property. There are three priorities of fire suppression — life, property, and the environment. Life will always be the number 1 priority but the priority firefighters place on property and the environment will depend on whether the fire is threatening a natural resource that is vital to the economic stability of the area.

Everyone in the community must take individual responsibility to prepare and protect their home, business, family, and the community from the risk of a wildfire. By doing this, we will give firefighters the help they need to do their job when a wildfire incident occurs. Check with your local fire agency and take steps to find out how you can help prevent or lessen the effects of a wildfire. We can't always prevent or stop wildfire, but we can be prepared for the day this uninvited guest pays a visit to our backyard!

PARTNERS IN PROTECTION

Wildfire

Be Prepared!

Have A Plan — Know What to do Before and During a Wildfire Incident

Plan ahead

A major wildfire in your neighborhood will have a great impact on your activities and you may find yourself without modern conveniences. You can lessen the impact by planning ahead.

When you can check each of the boxes below, your property will be FireSmart and you will be prepared for an interface fire.

- ❑ Store at least a three-day supply of drinking water and food that does not require refrigeration or cooking.
- ❑ Store a portable battery- or solar-powered radio, flashlight, emergency cooking equipment, portable lanterns, and batteries.
- ❑ Consider purchasing a portable generator to supply power for lights, and for heating and cooking.
- ❑ Maintain first-aid supplies to treat the injured until help arrives.
- ❑ Have an escape plan so that all members of the family know how to get out of the house quickly and safely.
- ❑ Have a contingency plan so family members can contact each other in case they are separated during an evacuation.
- ❑ Make sure all family members are familiar with STOP, DROP, AND ROLL, if their clothes should catch on fire.

If fire is approaching your home

If you see a fire approaching your home, report it immediately by dialing 9-1-1 or your local emergency number. If it is safe, and there is time before the fire arrives, you should take the following action:

- Close all windows and doors in the house.
- Place pre-cut plywood covers over the vents, windows, and other openings of the house.
- Park your car, unlocked, with the keys in the ignition and positioned forward out of the driveway. Keep car windows closed and have your valuables already packed in your car.
- Turn off propane or natural gas.
- Turn on the lights in the house, porch, garage and yard.
- Inside the house, move combustible materials such as light curtains and furniture away from the windows.
- Place a ladder to the roof in the front of the house.
- Put lawn sprinklers on the roof of the house and turn on the water.
- Move all combustibles away from the house including firewood, lawn furniture, etc.
- Evacuate your family and pets to a safe location.
- Stay tuned to your local radio station for up-to-date information on the fire and possible road closures.

PARTNERS IN PROTECTION

Wildfire

Check It Out!

Check - To See if Your Home and Landscape is FireSmart

1. Protect the roof over your head

The roof is the most vulnerable component of your home. Untreated wooden shake roofs are the number 1 cause of structure losses during wildfires. A wildfire produces flaming debris that travels in the air in advance of the fire. Embers landing on a combustible roof can start the roof on fire, spreading quickly to the rest of the house.

- ❑ Your roof is made from fire-resistant materials such as metal, slate, tile, or asphalt shingles.
- ❑ All overhanging branches, needles, and other debris have been cleared from your roof and gutters.

2. Create a FireSmart landscape

Maintain Defensible Space - 10 metres around your home

A defensible space is an area that will help keep flames away from your home and provide firefighters with access around your home. If you can, create a FireSmart landscape at least 10 metres around your house to reduce the chance of a wildfire spreading onto your property and burning through to your home.

- ❑ Flammable vegetation within 10 metres of your home has been removed or converted to fire resistant plants (e.g. broad-leaf deciduous trees, low shrubs, ferns, annuals, etc.).
- ❑ The plants in your yard have been spaced three metres apart.
- ❑ Dead leaves, dry brush, twigs, and needles have been removed from your roof and from around your home.

Break the chain of fuel - 10 to 30 metres around your home

Fire needs fuel to burn. You can sap its strength by breaking the path of continuous vegetation that can carry flames from your landscape to your house. Low tree branches allow fire to spread from the ground into the treetops.

- ❑ Trees have been removed or thinned to reduce the chance of fire spreading from tree to tree.
- ❑ Trees have been pruned at least two metres from the ground.
- ❑ Stacks of wood and piles of debris have been removed from around your home.

3. Make a FireSmart exterior

During a wildfire windows may break and allow the fire to travel into your home. Although pane windows reduce the probability of fire spreading, the most effective fire protection is achieved by covering vents, windows, and other openings (e.g., attic vents) with solid plywood shutters if fire is approaching. A home with non-combustible siding is resistant to fire. Overhanging decks and balconies will trap heat under the deck igniting the deck and siding. Materials stored under the deck add to the problem. Many homes use propane for heating. If exposed to fire, propane tanks may explode with disastrous consequences.

- ❑ The exterior finish on your home is made from non-combustible materials such as stucco, metal, brick, or cement.
- ❑ You have pre-cut solid plywood shutters to fit over vents, windows, and other openings, and have them stored in an accessible location.
- ❑ Your deck is built with non-flammable sheathing and has heavy support timbers.
- ❑ All debris has been removed from under your deck.
- ❑ Your propane and natural gas tanks are located at least 10 metres from buildings and vegetation has been cleared within three metres of the tank(s).

PARTNERS IN PROTECTION

Wildfire — Check It Out!

Manufactured homes
Manufactured homes should be skirted with a non-combustible material to prevent flammable material and embers from blowing under the home.

- ❑ The skirting on your manufactured home has a non-combustible material finish such as stucco, metal, brick, or cement.

4. Firewood and waste burning
Careless burning indoors and out has been the cause of many wildfires. Burning wood in your fireplace can start a wildfire if sparks ignite your roof. If you must burn, do it safely.

- ❑ You have removed all vegetation within three metres of your chimney.
- ❑ An approved spark arrestor has been installed on your chimney.
- ❑ Your fire pit is located away from your structures and flammable vegetation.
- ❑ When burning in your barrel, you have ensured that:
- ❑ Your barrel is in good condition
- ❑ The ground is free of debris three metres around the barrel
- ❑ You have steel rods or pipes holding the burning material up from the bottom of the barrel
- ❑ A mesh screen (with openings no larger than 7 millimetres) has been placed on top of the barrel
- ❑ Firefighting tools (shovel, rake, water buckets, garden hose) are close at hand
- ❑ After burning, you have placed the ashes in a metal container, soaked them with water and let them sit for two or three days before disposing of them into a pit

5. Human-caused ignitions are no accident
Lightning ignites some wildfires but many are caused from human negligence. Check to see if you know why wildfires are started year after year.

- Homeowners using unsafe incinerators or fire pits.
- Farmers and acreage owners burning off landscape in hot, dry, windy conditions.
- Children playing with matches.
- Children or adults playing with fireworks.
- Motorists or outdoor enthusiasts throwing a burning cigarette or match into dry vegetation.
- Campers disregarding camp fire regulations.
- Heavy equipment being operated without a spark arrestor installed on the exhaust.
- Railroads (e.g., brake sparks).
- Blasting operations.
- Electric fences.
- Downed power lines.
- Vehicle fires.
- Burning and landfill sites that border grassland or treed areas.

An assessment form is available through your local fire agency that will help you evaluate the threat that wildfire poses to your house and landscape before or after development. As you go through the form you will better understand the steps you can take to mitigate the problem.

Emergency Phone Numbers

Local Fire Department _____

Police _____

Alberta Forest Service _____
or 427-FIRE (COLLECT)

Other _____

Identification of your property _____

Address or lot number _____

The Department of Environmental Protection and the Crown accept no responsibility or liability for any loss or damage that any person may sustain as a result of the information in, or anything done or omitted pursuant to, this pamphlet.

BERTIE BEAVER SAYS:
COOPERATION PREVENTS WILDFIRES
START TODAY TO PROTECT YOUR FOREST HOME FROM FIRE.

For additional information contact your local Ranger Station, County or Municipal Office.

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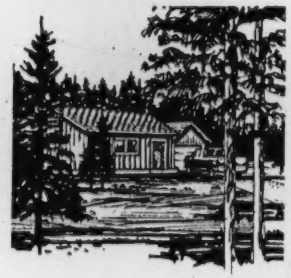
Protect Your Forest Home From Fire



Alberta

Rural Realties

As a forest area resident you can help protect your home, your family and the environment from fire.

Begin by recognizing the threat of fire. Be familiar with preventative steps and have an action plan you can follow to reduce danger should a fire occur.

There are two types of fire that you should be aware of: the fire that threatens your property from an outside source, and secondly, the fire which originates from your activities. Wildfire from either source can be extremely destructive.

Your fire prevention awareness is especially important in this rural setting because a local fire department may not be as responsive or as completely equipped as its urban counterpart.

Remember that, although Forest Service firefighters are equipped to handle forest and wildland fires, they are not adequately trained or outfitted to deal with structural fires.

BE FIRESAFE. The preventative work done now by you and your neighbours reduces fire hazard and protects your investment and the forest against wildfire.

START TODAY TO PROTECT YOUR FOREST HOME FROM FIRE.

How Prepared Are You?

1. Are evergreen trees thinned and brush removed at least 10 metres from around your building? ☐
2. Are tree branches pruned one to two metres above ground to prevent surface fires from spreading to tree tops? ☐
3. Are grass and weeds mowed for ten metres around the house? Is your yard free from leaves and debris? ☐
4. Is your street, lot number and name clearly visible from the road? ☐
5. Is your driveway wide enough for emergency vehicle access? ☐
6. Is the spark arrester or screen on your chimney or stove pipe adequate? Do you check and clean your chimney or stove pipe on a regular basis? ☐
7. Are roof and gutters free of leaves, twigs and other debris? ☐
8. Is firewood stacked a minimum of eight metres from the house? ☐
9. Is there adequate exterior water supply for emergency use? ☐
10. Do you have a garden hose, ladder and fire-fighting tools within easy reach? ☐
11. Is your outdoor fire pit or ring situated in a cleared area and all overhanging vegetation cut away? ☐
12. Do you have an area in which chain saws and small engines can be refuelled safely? ☐
13. Do you have fire extinguishers, ten pounds or heavier, readily available? ☐
14. Do you have a screened receptacle for disposing of debris? Did you check local burning regulations to determine if a fire permit is required? Do you haul debris to a refuse site? ☐
15. Do you have a contingency plan in the event of a fire? Does your family know the escape routes, who to call and what to do? ☐

HAVE YOU CHECKED ALL OF THE ABOVE? IF NOT YOU MAY HAVE GIVEN FIRE A PLACE TO START.

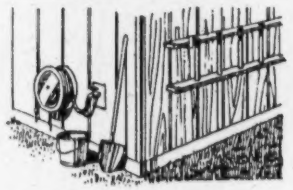
Build Fire Protection Into

Your Surroundings

A Supply a pond or underground cistern for emergency water supply and fence for safety.
B Dig a pit for ashes.
C Thin trees to 30 metres from house.
D Prune trees to 10 metres from house.
E Provide adequate spark arrestor on chimney.
F Give your driveway 3 metres clearance from treeline.
G Ensure that your driveway is uncluttered and wide enough for emergency vehicle access and space for turnaround.
H Your name and lot number should be clearly visible from road for quick identification.
I Keep branches clear of power lines. If possible bury power lines.
J Provide an Emergency exit road
K Prune limbs 1 - 2 metres from ground level.
L Store firewood away from house.
M Remove brush and tree cover. Mow dry grasses and weeds. Apply water regularly.
N Position your propane tank with valve pointing away from house.

Your House

Screen:
Gutters, vents and under floor openings to prevent accumulation of flammable materials.
Shield:
Chimney with protective cap and screen or install an approved, securely attached spark arrestor.
Treat:
Exteriors with fire retardant.
Shield:
Windows with protective shutters, fire resistant drapes or other protective measures to safeguard interior from radiant heat.



Preconnected garden hose. Firefighting tools (shovel, rakes, pails). Ladder long enough to reach roof.

Debris Disposal

Obtain Fire Permit from local authorities or, better yet, haul debris to a land fill site.

Barrel in good condition.

Ground clean and maintained for 3 metres.

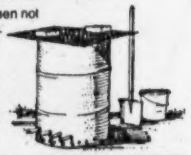
Help combustion. Steel rods or pipes will hold burning material up and give a better burn. Draft holes not larger than 5 mm. in diameter.

Mesh size of screen not larger than 7 mm.

Weights to hold screen on barrel.

Keep fire fighting tools on hand.

Never leave your fire unattended.



Ash Disposal

1. Place in metal container.

2. Soak with water.

3. Let sit for 2-3 days before disposal.

4. Dispose of ashes in a pit.

IF FOUND PLEASE RETURN TO:
LOUISE STEWART, RECREATION, PARKS AND CULTURE
STRATHCONA COUNTY 464-8496, 909-0124

Form # ___
Location ___
Date ___

Appendix D

WILDFIRE HAZARD ASSESSMENT FORM

Structure and Site Hazard Assessment

	Factor	Characteristics and Point Ratings				Score
1	Roofing Material	Metal, tile, asphalt, ULC rated shakes or non-combustible material		Unrated wood shakes		
		0		30		
2	Roof Cleanliness	No combustible material	Scattered combustible material, < 1cm in depth	Clogged gutter, combustible material > 1cm in depth		
		0	2	3		
3	Building Exterior	Non-combustible, Stucco or metal siding	Log, heavy timbers	Wood or vinyl siding or wood shake		
		0	1	6		
4	Eaves, Vents and Openings	Closed eaves, vents screened with 3mm mesh and accessible	Closed eaves, vents not screened with 3mm mesh	Open eaves, vents not screened, debris accumulation		
		0	1	6		
5	Balcony, Deck, or Porch	Non-fire resistant material sheathed in	Combustible material, sheathed in	Combustible material, not sheathed in		
		0	2	6		
6	Window and Door Glazing	Tempered	Double Pane		Single Pane	
			Small/med	Large	Small/med	Large
		0	1	2	2	4
7	Location of Woodpiles and Combustible	None or >10 metres from structure	3 - 10 metres from structure		< 3 metres from structure	
		0	3		6	
8	Set back from edge	Adequate		Inadequate		
		0		6		
9	Forest Vegetation (overstory)	Deciduous	Mixedwood	Coniferous		
				Separated	Continuous	
	< 10 metres	3	5	15	20	
	10 - 30 metres	1	3	10	15	
10	Surface Vegetation	Lawn or non-combustible material	Wild grass or shrubs	Dead and down woody material		
				Scattered	Abundant	
	< 10 metres	0	5	5	15	
	10 - 30 metres	0	3	3	10	
11	Ladder Fuels	Absent	Scattered	Abundant		
	< 10 metres	0	4	10		
	10 - 30 metres	0	3	7		
				TOTAL SCORE FOR FACTORS 1 - 11		
				STRUCTURE AND SITE HAZARD LEVEL		

Area Hazard Assessment

	Factor	Characteristic and Point Ratings				Score
12	Forest Vegetation	Deciduous	Mixed Wood	Coniferous		
				Separated	Continuous	
		3	5	15	20	
13	Surface Vegetation	Lawn or non-combustible material	Wild grass or shrubs	Dead and down woody material		
				Scattered	Abundant	
		0	5	5	10	
14	Ladder Fuels	Absent	Scattered	Continuous		
		0	4	10		
15	Slope	0 - 10 %	10 - 25 %	> 25 %		
			Even	Gullied	Even	Gullied
		0	4	5	8	10
16	Position on Slope	Valley bottom or lower-slope	Mid-slope	Upper-slope		
		0	3	5		
				TOTAL SCORE FOR FACTORS 12 - 16		
				AREA HAZARD LEVEL		

Remarks: _____

Hazard Level	
Low	< 21 points
Moderate	21 - 29 points
High	30 - 35 points
Extreme	> 35 points

FIRE IGNITION AND PREVENTION CHECKLIST			
Factor	**Page Reference**	**Yes**	**No**
Ignition Potential (Area)			
Frequent lightning fires	54		
Frequent or potential for human caused fires	54		
Aspect - Sounth or West	54		
Ignition Potential (Structure and Site)			
Chimney - Unscreened	55		
Chimney - Overhanging branches	55		
Chimney - Inadequate Clearance	55		
Burnng Barrel / Fire Pit - Inadequate	56		
Overhead Powerlines near vegetation / structure	57		
Propane tanks near vegetation / structure	57		

FIRE SUPRESSION CHECKLIST			
Factor	**Page Reference**	**Yes**	**No**
Fire Service			
Response time > 10 minutes	58		
Access to area for emergency vehicles - inadequate	59		
Access to structure - inadequate	59		
Water Supply			
Municipal - Not Available	61		
On-site - Not Available	62		
Suppression equipment on site - Not Available	63		

Further Remarks:

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Leadhand - Arboriculture
Recreation, Parks and Culture
Strathcona County
2025 Oak St, Sherwood Park, Ab
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780-464-8496, 780-464-8111
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Second survey (follow-up survey) sent to all those responding from each group. Letters are specific to each group in terms of response rates and sample size mentioned.

Second survey letters sent to Group 1, Group 2 and Group 3

Dear Homeowner, (Group 1)

In May of 2000, the survey, "Analyzing the Wildland/Urban Interface in Strathcona County", was sent to 123 randomly selected across rural Strathcona County. A total of 44% responded and I wish to thank those people. For the second part of this study, I would ask you to answer the following questions in the table below. This table is designed to find out if the survey raised any issues with you or your family in regards to the potential fires hazards on your property. These results will help determine if the survey was worthwhile and possibly expanded in the future. All information is entered into a database and any information that pertains to your identity is not required.

Thank you for your time and commitment to this project. All responses are very valuable to this study.

Sincerely,

Louise Stewart

Please check the appropriate box. If you check 'plan to do in future', please explain in comments i.e. time required, expense etc.

	YES	NO	PLAN TO IN FUTURE	N/A	COMMENTS
Obtained additional fire extinguishers					
Obtained additional smoke detectors					
Installed a security system that can detect fire					
Completely removed fire pit					
Relocated fire pit to another location away from home					
Relocated fire pit to another location away from vegetation					
Put a screen on fire pit					
Decreased or changed the types of materials burned in the fire pit					
Completely removed burning barrel					
Relocated burning barrel to another location away from home					
Relocated burning barrel to another location away from vegetation					
Put a screen on the burning barrel					
Decreased or changed the types of materials burned in the burning barrel					
Moved firewood/woodpiles further away from home					
Moved firewood/woodpiles further away from vegetation					
Moved firewood/woodpiles further away from home					
Removed vegetation/thin trees within 30m of home					
Removed vegetation/thin trees within 100m of home					
Remove debris from roof/gutters more often					
Added an address sign near your driveway					

Increased the size or made more visible the address sign near your driveway					
Changed your siding material to a less flammable material					
Changed your roofing material to a less flammable material					
Installed tempered or double paned windows					
Sheathed in deck/porch so debris cannot accumulate underneath					
Widened access road to home to allow access by emergency vehicles					
Added water pump/hoses					
Relocated tools/hoses etc. so they are easily accessible					
Become more aware of your neighbors and their properties					
Talked to your neighbors about potential fire hazards on their property					
Cleared away vegetation between road and home so that home is more visible from road					
Consult written material on fire prevention, safety etc.					
Explored fire information sites on the internet					
Talked to family in home regarding fire safety					
Remove debris accumulating in yard regularly					
Do you feel you are more aware of potential fire hazards that may be on your property since completing the survey					
Called the Fire Dept. to discuss any fire hazard concerns					
Called any elected officials to discuss any fire hazard concerns					

Please return in the SASE. Thank you very much.

Dear Homeowner (Group 2),

In May of 2000, the survey, "Analyzing the Wildland/Urban Interface in Strathcona County", was sent to 129 randomly selected across rural Strathcona County. A total of 47% responded and I wish to thank those people who provided us with valuable information. If you were unable to respond but would like to submit it now, the original survey has been included. If you have responded, I would ask you to answer the following questions in the table below. The questions below are designed to ascertain if the original survey and brochures encouraged you or your family to take preventative actions in any of the following ways. These results will help us better assess if the original survey was worthwhile and whether this approach should be continued in the future. All information is entered into a database and no information has been coded that would identify respondents.

Thank you for your time and commitment to this project. All responses are very valuable to this study.

Sincerely,

Louise Stewart

Please check the appropriate box. If you check 'plan to do in future', please explain in comments i.e. time required, expense etc.

	YES	NO	PLAN TO IN FUTURE	N/A	COMMENTS
Obtained additional fire extinguishers					
Obtained additional smoke detectors					
Installed a security system that can detect fire					
Completely removed fire pit					
Relocated fire pit to another location away from home					
Relocated fire pit to another location away from vegetation					
Put a screen on fire pit					
Decreased or changed the types of materials burned in the fire pit					
Completely removed burning barrel					
Relocated burning barrel to another location away from home					
Relocated burning barrel to another location away from vegetation					
Put a screen on the burning barrel					
Decreased or changed the types of materials burned in the burning barrel					
Moved firewood/woodpiles further away from home					
Moved firewood/woodpiles further away from vegetation					

	YES	NO	PLAN TO IN FUTURE	N/A	COMMENTS
Moved firewood/woodpiles further away from home					
Removed vegetation/thin trees within 30m of home					
Removed vegetation/thin trees within 100m of home					
Remove debris from roof/gutters more often					
Added an address sign near your driveway					
Increased the size or made more visible the address sign near your driveway					
Changed your siding material to a less flammable material					
Changed your roofing material to a less flammable material					
Installed tempered or double paned windows					
Sheathed in deck/porch so debris cannot accumulate underneath					
Widened access road to home to allow access by emergency vehicles					
Added waterpump/hoses					
Relocated tools/hoses etc. so they are easily accessible					
Become more aware of your neighbors and their properties					
Talked to your neighbors about potential fire hazards on their property					
Cleared away vegetation between road and home so that home is more visible from road					
Consult written material on fire prevention, safety etc.					
Explored fire information sites on the internet					
Talked to family in home regarding fire safety					
Remove debris accumulating in yard regularly					
Do you feel you are more aware of potential fire hazards that may be on your property since completing the survey					
Called the Fire Dept. to discuss any fire hazard concerns					
Called any elected officials to discuss any fire hazard concerns					

Please return in the envelope provided. Thank you very much.

Dear Homeowner (Group 3),

In May of 2000, the survey, "Analyzing the Wildland/Urban Interface in Strathcona County", was sent to 133 randomly selected across rural Strathcona County. A total of 30% responded and I wish to thank those people who provided us with valuable information. If you were unable to respond but would like to submit it now, the original survey has been included. If you have responded, I would ask you to answer the following questions in the table below. The questions below are designed to ascertain if the original survey, brochures and field assessment encouraged you or your family to take preventative actions in any of the following ways. These results will help us better assess if the original survey was worthwhile and whether this approach should be continued in the future. All information is entered into a database and no information has been coded that would identify respondents.

Thank you for your time and commitment to this project. All responses are very valuable to this study.

Sincerely,

Louise Stewart

Please check the appropriate box. If you check 'plan to do in future', please explain in comments i.e. time required, expense etc.

	YES	NO	PLAN TO IN FUTURE	N/A	COMMENTS
Obtained additional fire extinguishers					
Obtained additional smoke detectors					
Installed a security system that can detect fire					
Completely removed fire pit					
Relocated fire pit to another location away from home					
Relocated fire pit to another location away from vegetation					
Put a screen on fire pit					
Decreased or changed the types of materials burned in the fire pit					
Completely removed burning barrel					
Relocated burning barrel to another location away from home					
Relocated burning barrel to another location away from vegetation					
Put a screen on the burning barrel					
Decreased or changed the types of materials burned in the burning barrel					
Moved firewood/woodpiles further away from home					
Moved firewood/woodpiles further away from vegetation					

	YES	NO	PLAN TO IN FUTURE	N/A	COMMENTS
Moved firewood/woodpiles further away from home					
Removed vegetation/thin trees within 30m of home					
Removed vegetation/thin trees within 100m of home					
Remove debris from roof/gutters more often					
Added an address sign near your driveway					
Increased the size or made more visible the address sign near your driveway					
Changed your siding material to a less flammable material					
Changed your roofing material to a less flammable material					
Installed tempered or double paned windows					
Sheathed in deck/porch so debris cannot accumulate underneath					
Widened access road to home to allow access by emergency vehicles					
Added waterpump/hoses					
Relocated tools/hoses etc. so they are easily accessible					
Become more aware of your neighbors and their properties					
Talked to your neighbors about potential fire hazards on their property					
Cleared away vegetation between road and home so that home is more visible from road					
Consult written material on fire prevention, safety etc.					
Explored fire information sites on the internet					
Talked to family in home regarding fire safety					
Remove debris accumulating in yard regularly					
Do you feel you are more aware of potential fire hazards that may be on your property since completing the survey					
Called the Fire Dept. to discuss any fire hazard concerns					
Called any elected officials to discuss any fire hazard concerns					

Please return in the envelope provided. Thank you very much.

Louise Stewart
Department of Renewable Resources
751 GSB
University of Alberta
Edmonton, AB T6G 2H1

The data sheet used in the road-side survey.

Date	Road	Dir.	Mailbox	Signage		Size		Road	Visibility			Access	
				Perp.	Parallel	>5cm	<5cm	Width	Full	Partial	None	Gate	Clear

Response rates summary for first survey – all respondents.

Results summary from first survey for all respondents.

1. Number of years lived on property

	Percent
0-1 years	7.1
2-5 years	20.0
6-10 years	18.1
More than 10 years	54.8
Total	100.0

---

2. Is this your primary residence?

	Percent
Yes	100.0

---

3. Have you lived on an acreage or farm before?

	Percent
Yes	57.8
No	42.2
Total	100.0

---

4. Do you own or rent property?

	Percent
Own	100.0

---

5. How large is your property (acres)

Range 1 acre to 160 acres

Mean 12 acres

---

6. Did you build structures/buildings yourself? (skip pattern question)

	Percent
All	23.5
Some	34.6
None	41.8
Total	100.0

---

7. Did you consider the flammability of materials when building?

	Percent
Yes	51.1
No	30.7
Sometimes	18.2
Total	100.0

---

8. Tree species on property:

	Percent
Spruce/pine	92.9
Poplar/ash/maple/other etc	98.7

9. On a scale of 1-7, rate the fire danger on your property:

	Percent
No danger (1)	13.1
2	20.3
3	19.6
4	21.6
5	13.1
6	7.8
Extreme (7)	4.6
Total	100.0

10. Did you consider the risk of wildfire when you moved into your home?

	Percent
Yes	26.0
No	74.0
Total	100.0

11. If a fire were to occur, would your structures burn?

	Percent
Yes	51.3
No	24.0
Don't know	24.7
Total	100.0

12. Have you ever witnessed of forest fire? (skip pattern question)

	Percent
Yes	51.9
No	48.1
Total	100.0

13. Was it out of control?

	Percent
Yes	68.8
No	17.5
Don't know	13.8
Total	100.0

14. Where was the fire located?

Alberta
BC
Ontario
USA
Man.
Sask.
Yukon

15. Have you ever seen a grass/shrub fire in Strathcona County? (skip pattern question)

	Percent
Yes	61.0
No	39.0
Total	100.0

16. How many?

	Percent
1-2	41.9
3-4	32.3
5 or more	25.8
Total	100.0

17. Were structures/buildings destroyed?

	Percent
Yes	13.8
No	68.1
Don't know	18.1
Total	100.0

18. Were human lives lost?

	Percent
No	91.5
Don't know	8.5
Total	100.0

19. Do you feel wildfire is a threat to your home?

	Percent
Yes	23.7
No	47.4
Not sure	28.9
Total	100.0

20. Have you made modifications to the vegetation to reduce the fire hazard?

	Percent
Yes	52.0
No	48.0
Total	100.0

21. Do you regularly mow the lawn around house?

	Percent
Yes	97.4
No	1.3
Sometimes	1.3
Total	100.0

22. Do you mow lawn around other buildings?

	Percent
Yes	78.3
No	10.5
Sometimes	11.2
Total	100.0

---

23. Do you have a fire pit? (skip pattern question)

	Percent
Yes	77.9
No	22.1
Total	100.0

---

24. Is there a screen on the pit?

	Percent
Yes	45.8
No	54.2
Total	100.0

---

25. How far from vegetation is the fire pit?

	Percent
<10m	52.9
10-15m	32.8
>15m	14.3
Total	100.0

---

26. How far from the house is the fire pit?

	Percent
<10m	23.5
10-15m	32.8
>15m	43.7
Total	100.0

---

27. Do you burn leaves and other debris in the fire pit?

	Percent
Usually	11.8
Sometimes	19.3
Rarely	33.6
Never	35.3
Total	100.0

---

28. Do you have a burning barrel? (skip pattern question)

	Percent
Yes	34.9
No	65.1
Total	100.0

29. Is there a screen on the barrel?

	Percent
Yes	75.5
No	24.5
Total	100.0

30. How far from vegetation is the barrel?

	Percent
<10m	51.9
10-15m	34.6
>15m	13.5
Total	100.0

31. How far from a structure is the barrel?

	Percent
<10m	15.4
10-15m	38.5
>15m	46.2
Total	100.0

32. Do you burn leaves and other debris in the barrel?

	Percent
Usually	11.3
Sometimes	34.0
Rarely	24.5
Never	30.2
Total	100.0

33. Do you have fire insurance?

	Percent
Yes	98.7
No	.6
Don't know	.6
Total	100.0

34. Have you ever been denied fire insurance?

	Percent
No	100.0

35. How visible is your house from the road?

	Percent
Clearly visible	39.0
Partially visible	55.2
Not visible	5.8
Total	100.0

36. Are the address numbers on your address sign?

	Percent
<5cm	1.3
5cm or larger	92.9
Don't have an address sign	5.8
Total	100.0

37. Is your address sign located on your mailbox? (skip pattern question)

	Percent
Yes	25.3
No	74.7
Total	100.0

38. Are the address numbers on your mailbox?

	Percent
<5cm	7.9
5cm or larger	68.4
Don't have numbers on mailbox	2.6
Mail delivered to a different location	21.1
Total	100.0

39. Are the address numbers on your house?

	Percent
<5cm	.7
5cm or larger	12.5
Don't have numbers on the house	86.8
Total	100.0

40. Where do you keep your firewood?

	Percent
Inside the home	1.3
Within another structure	15.6
Outside, stacked beside building	22.7
Outside, away from all buildings	46.1
Other location	2.6
Don't store firewood	11.7
Total	100.0

41. How often do you clean your gutters?

	Percent
<1 time per year	15.0
1 time per year	43.1
2 times per year	27.5
3 times per year	11.8
>3 times per year	2.6
Total	100.0

42. What material is your roof made of?

	Percent
Metal	2.6
Tar paper	.7
Tile	.7
Asphalt	68.6
Fire resistant treated wood shakes	5.2
Untreated wood shakes	15.0
Other	5.9
Don't know	1.3
Total	100.0

43. What type of siding is on your house?

	Percent
Stucco	26.8
Vinyl	30.7
Wood	26.1
Metal	9.2
Brick	3.9
Other	2.6
Don't know	.7
Total	100.0

44. How would you rate the amount spent by SC on fire prevention/preparedness?

	Percent
Too much	1.3
Just about the right amount	26.1
Too little	3.9
Don't know	68.6
Total	100.0

45. How much have your neighbors done in comparison to you?

	Percent
More	.7
About the same	25.5
Less	9.2
Don't know	64.7
Total	100.0

46. Who do you feel is responsible for protecting homeowners in Strathcona County?

	Percent
100% HO	6.6
75% HO, 25% SC	19.9
50% HO, 50% SC	40.4
25% HO, 75% SC	9.9
100% SC	9.9
Don't know	9.9
Other	3.3
Total	100.0

47. Do you feel taxes in Strathcona County are

	Percent
Too high	43.0
Between too high and the right amount	25.2
Just about the right amount	24.5
Between too little and the right amount	1.3
Don't know	6.0
Total	100.0

48. Event that poses risk to you, number 1 ranking

	Percent
Tornado destroys your home	1.5
Car accident sends you to hospital	55.0
Victim of robbery	37.4
Wildfire destroys home	6.1
Total	100.0

48. Rank event in order of risk, number 2 ranking

	Percent
Tornado destroys home	5.6
Car accident sends you to hospital	38.9
Victim of robbery	44.4
Wildfire destroys your home	11.1
Total	100.0

48. Rank event in order of risk, number 3 ranking

	Percent
Tornado destroys home	8.5
Car accident sends you to hospital	10.0
Victim of robbery	13.8
Wildfire destroys your home	67.7
Total	100.0

48. Rank event in order of risk, number 4 ranking

	Percent
Tornado destroys home	81.7
Car accident sends you to hospital	1.6
Victim of robbery	4.8
Wildfire destroys your home	11.9
Total	100.0

49. Have you ever watched programs on TV regarding forest fires?

	Percent
Yes	84.3
No	15.7
Total	100.0

50. Do you watch nature programming?

	Percent
Always	20.1
Sometimes	68.8
Rarely	9.7
Never	1.3
Total	100.0

52. Do you use the Internet? (skip pattern question)

	Percent
Often	28.0
Sometimes	33.3
Rarely	9.3
Never	29.3
Total	100.0

53. Ever explored various fire information sites?

	Percent
Yes	1.8
No	98.2
Total	100.0

54. Do you read a daily paper?

	Percent
Often	54.6
Sometimes	21.1
Rarely	17.1
Never	7.2
Total	100.0

55. Is the newspaper delivered to your home?

	Percent
Yes	57.4
No	42.6
Total	100.0

57. Do you read local papers?

	Percent
Often	68.0
Sometimes	24.2
Rarely	4.6
Never	3.3
Total	100.0

59. Gender?

	Percent
Female	37.6
Male	62.4
Total	100.0

60. How old are you?

	Percent
18-30	2.7
31-40	22.0
41-50	30.0
51-60	27.3
61-70	12.7
70+	5.3
Total	100.0

61. Highest level of education?

	Percent
Some high school	7.4
Completed high school	12.2
Some tech./college	11.5
Completed tech./college	32.4
Some university	8.8
University	26.4
Other	1.4
Total	100.0

62. Level of employment

	Percent
Employed at home	12.8
Employed outside home	57.0
Retired	18.8
Other	11.4
Total	100.0

63. Is there normally someone home during the day?

	Percent
Yes	61.6
No	38.4
Total	100.0

64. Household income

	Percent
<30000	5.1
30001-45000	12.0
45001-60000	23.1
60001-75000	19.7
75001-90000	16.2
>90000	23.9
Total	100.0

65. How many people currently live here over 18?

	Percent
1	6.5
2	64.5
3	16.8
4	4.5
5	1.3
Total	93.5

65. How many people currently live here under 18?

	Percent
0	65.1
1	12.9
2	15.5
3	5.2
4	1.3
Total	100.0

66. Would you like to receive a summary of the results?

	Percent
Yes	79.3
No	20.7
Total	100.0

Chi Square Values from Second Survey

group number * obtained additional smoke detectors

Crosstab

Count

		obtained additional smoke detectors		Total
		yes/plan to	no	
group number	group 1	2	17	19
	group 2	18	58	76
	group 3	12	33	45
Total number of respondents		32	108	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.038	0.361
N of Valid Cases	140	

group number * installed a security system that detects fire

Crosstab

Count

		installed a security system that detects fire		Total
		yes/plan to	no	
group number	group 1		19	19
	group 2	10	66	76
	group 3		45	45
Total number of respondents		10	130	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.069	0.011
N of Valid Cases	140	

group number * obtained extinguishers yes and plan =0 no =1

Crosstab

Count

		obtained extinguishers yes and plan =0 no =1		Total
		yes/plan to	no	
group number	group 1	3	16	19
	group 2	14	62	76
	group 3	6	39	45
Total number of respondents		23	117	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.539	0.764
N of Valid Cases	140	

group number * remove fire pit

Crosstab

Count

		remove fire pit		Total
		yes/plan to	no	
group number	group 1	2	14	16
	group 2		66	66
	group 3	3	36	39
Total number of respondents		5	116	121
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.921	0.031
N of Valid Cases	121	

group number * relocate fire pit away from home

Crosstab

Count

		relocate fire pit away from home		Total
		yes/plan to	no	
group number	group 1	1	13	14
	group 2	8	58	66
	group 3	3	36	39
Total number of respondents		12	107	119
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.682	0.711
N of Valid Cases	119	

group number * relocate fire pit away from vegetation

Crosstab

Count

		relocate fire pit away from vegetation		Total
		yes/plan to	no	
group number	group 1	1	13	14
	group 2	12	54	66
	group 3	6	33	39
Total number of respondents		19	100	119
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.064	0.588
N of Valid Cases	119	

group number * put screen on fire pit

Crosstab

Count

		put screen on fire pit		Total
		yes/plan to	no	
group number	group 1	1	13	14
	group 2	18	46	64
	group 3	12	27	39
Total number of respondents		31	86	117
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.145	0.207
N of Valid Cases	117	

group number * burning materials in fire pit

Crosstab

Count

		burning materials in fire pit		Total
		yes/plan to	no	
group number	group 1	1	13	14
	group 2	10	52	62
	group 3	6	33	39
Total number of respondents		17	98	115
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.749	0.688
N of Valid Cases	115	

group number * remove burning barrel

Crosstab

Count

		remove burning barrel		Total
		yes/plan to	no	
group number	group 1	3	6	9
	group 2	8	32	40
	group 3		21	21
Total number of respondents		11	59	70
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.579	0.037
N of Valid Cases	70	

group number * relocate burning barrel away from home

Crosstab

Count

		relocate burning barrel away from home		Total
		yes/plan to	no	
group number	group 1	1	7	8
	group 2	2	30	32
	group 3	3	18	21
Total number of respondents		6	55	61
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.997	0.607
N of Valid Cases	61	

group number * relocate burning barrel away from vegetation

Crosstab

Count

		relocate burning barrel away from vegetation		Total
		yes/plan to	no	
group number	group 1	1	7	8
	group 2	4	28	32
	group 3	3	18	21
Total number of respondents		8	53	61
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.039	0.981
N of Valid Cases	61	

group number * screen on burning barrel

Crosstab

Count

		screen on burning barrel		Total
		yes/plan to	no	
group number	group 1	3	5	8
	group 2	8	24	32
	group 3	9	12	21
Total number of respondents		20	41	61
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.928	0.381
N of Valid Cases	61	

group number * materials burned in burning barrel

Crosstab

Count

		materials burned in burning barrel		Total
		yes/plan to	no	
group number	group 1	2	6	8
	group 2	4	28	32
	group 3	3	18	21
Total number of respondents		9	52	61
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.801	0.67
N of Valid Cases	61	

group number * moved firewood piles away from home

Crosstab

Count

		moved firewood piles away from home		Total
		yes/plan to	no	
group number	group 1	5	11	16
	group 2	20	50	70
	group 3	12	30	42
Total number of respondents		37	91	128
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.049	0.976
N of Valid Cases	128	

group number * moved firewood away from vegetation

Crosstab

Count

		moved firewood away from vegetation		Total
		yes/plan to	no	
group number	group 1	2	14	16
	group 2	10	60	70
	group 3	3	39	42
Total number of respondents		15	113	128
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.305	0.521
N of Valid Cases	128	

group number * removed or thinned with 30m

Crosstab

Count

		removed or thinned with 30m		Total
		yes/plan to	no	
group number	group 1	10	8	18
	group 2	26	44	70
	group 3	9	30	39
Total number of respondents		45	82	127
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.878	0.053
N of Valid Cases	127	

group number * remove or thin veg within 100m

Crosstab

Count

		remove or thin veg within 100m		Total
		yes/plan to	no	
group number	group 1	6	12	18
	group 2	10	62	72
	group 3	6	36	42
Total number of respondents		22	110	132
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.171	0.124
N of Valid Cases	132	

group number * remove debris or clean gutters more often

Crosstab

Count

		remove debris or clean gutters more often		Total
		yes/plan to	no	
group number	group 1	10	9	19
	group 2	40	36	76
	group 3	18	24	42
Total number of respondents		68	69	137
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.113	0.573
N of Valid Cases	137	

group number * added an address sign

Crosstab

Count

		added an address sign		Total
		yes/plan to	no	
group number	group 1	7	12	19
	group 2	26	50	76
	group 3	6	39	45
Total number of respondents		39	101	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.013	0.03
N of Valid Cases	140	

group number * increased size or visibility if sign

Crosstab

Count

		increased size or visibility if sign		Total
		yes/plan to	no	
group number	group 1	3	15	18
	group 2	16	58	74
	group 3	12	33	45
Total number of respondents		31	106	137
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.827	0.661
N of Valid Cases	137	

group number * changed siding to less flammable

Crosstab

Count

		changed siding to less flammable		Total
		yes/plan to	no	
group number	group 1	4	15	19
	group 2	4	72	76
	group 3	12	33	45
Total number of respondents		20	120	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.396	0.003
N of Valid Cases	140	

group number * changed roofing to less flammable

Crosstab

Count

		changed roofing to less flammable		Total
		yes/plan to	no	
group number	group 1	2	17	19
	group 2	6	70	76
	group 3	9	36	45
Total number of respondents		17	123	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.936	0.14
N of Valid Cases	140	

group number * changed windows to double or tempered

Crosstab

Count

		changed windows to double or tempered		Total
		yes/plan to	no	
group number	group 1	2	17	19
	group 2	14	62	76
	group 3	3	42	45
Total number of respondents		19	121	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.503	0.174
N of Valid Cases	140	

group number * sheathed in deck

Crosstab

Count

		sheathed in deck		Total
		yes/plan to	no	
group number	group 1	2	16	18
	group 2	16	50	66
	group 3	9	24	33
Total number of respondents		27	90	117
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.83	0.401
N of Valid Cases	117	

group number * widened road for access by emergency vehicles

Crosstab

Count

		widened road for access by emergency vehicles		Total
		yes/plan to	no	
group number	group 1	2	17	19
	group 2	12	64	76
	group 3	6	39	45
Total number of respondents		20	120	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.393	0.822
N of Valid Cases	140	

group number * added water pump or hoses

Crosstab

Count

		added water pump or hoses		Total
		yes/plan to	no	
group number	group 1	1	18	19
	group 2	10	66	76
	group 3	3	42	45
Total number of respondents		14	126	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.871	0.392
N of Valid Cases	140	

group number * relocated tools so they are more accessible

Crosstab

Count

		relocated tools so they are more accessible		Total
		yes/plan to	no	
group number	group 1	3	16	19
	group 2	18	58	76
	group 3	3	42	45
Total number of respondents		24	116	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.791	0.055
N of Valid Cases	140	

group number * become more aware of your neighbors and their properties

Crosstab

Count

		become more aware of your neighbors and their properties		Total
		yes/plan to	no	
group number	group 1	7	11	18
	group 2	24	50	74
	group 3	21	24	45
Total number of respondents		52	85	137
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.415	0.299
N of Valid Cases	137	

group number * talk to neighbors regarding potential fire hazards on their property

Crosstab

Count

		talk to neighbors regarding potential fire hazards on their property		Total
		yes/plan to	no	
group number	group 1	1	18	19
	group 2	6	70	76
	group 3		42	42
Total number of respondents		7	130	137
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.478	0.176
N of Valid Cases	137	

group number * cleared away veg so home is more visible from road

Crosstab

Count

		cleared away veg so home is more visible from road		Total
		yes/plan to	no	
group number	group 1	4	13	17
	group 2	20	56	76
	group 3	3	33	36
Total number of respondents		27	102	129
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.853	0.088
N of Valid Cases	129	

group number * consult written material on fire safety/prevention

Crosstab

Count

		consult written material on fire safety/prevention		Total
		yes/plan to	no	
group number	group 1	6	13	19
	group 2	26	48	74
	group 3	12	33	45
Total number of respondents		44	94	138
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.925	0.63
N of Valid Cases	138	

group number * explored fire info sites on internet

Crosstab

Count

		explored fire info sites on internet		Total
		yes/plan to	no	
group number	group 1	1	17	18
	group 2	2	68	70
	group 3		42	42
Total number of respondents		3	127	130
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.928	0.381
N of Valid Cases	130	

group number * talked to family regarding fire safety in the home

Crosstab

Count

		talked to family regarding fire safety in the home		Total
		yes/plan to	no	
group number	group 1	9	10	19
	group 2	44	30	74
	group 3	21	24	45
Total number of respondents		74	64	138
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.188	0.335
N of Valid Cases	138	

group number * remove debris accumulating in yard regularly

Crosstab

Count

		remove debris accumulating in yard regularly		Total
		yes/plan to	no	
group number	group 1	14	5	19
	group 2	54	22	76
	group 3	30	15	45
Total number of respondents		98	42	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.401	0.818
N of Valid Cases	140	

group number * more aware of fire since completing the survey

Crosstab

Count

		more aware of fire since completing the survey		Total
		yes/plan to	no	
group number	group 1	10	9	19
	group 2	52	24	76
	group 3	36	9	45
Total number of respondents		98	42	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.962	0.084
N of Valid Cases	140	

group number * called fire department to discuss concerns

Crosstab

Count

		called fire department to discuss concerns		Total
		yes/plan to	no	
group number	group 1	1	18	19
	group 2	8	68	76
	group 3		45	45
Total number of respondents		9	131	140
Maximum number of respondents possible				153

Chi-Square Tests

	Value	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.256	0.072
N of Valid Cases	140	

group number * called elected officials to discuss concerns

Crosstab

Count

		called elected officials to discuss concerns	Total
		no	
group number	group 1	19	19
	group 2	76	76
	group 3	45	45
Total number of respondents		140	140
Maximum number of respondents possible			153

Chi-Square Tests

	Value
Pearson Chi-Square	.(a)
N of Valid Cases	140
a No statistics are computed because called elected officials to discuss concerns is a constant.	